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LCD TV

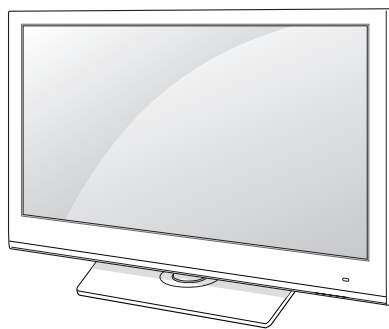
SERVICE MANUAL

CHASSIS : LA01U

MODEL : 47LK520 47LK520-UA

CAUTION

BEFORE SERVICING THE CHASSIS,
READ THE SAFETY PRECAUTIONS IN THIS MANUAL.



P/NO : MFL67021017 (1101-REV00)

Printed in Korea

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SVC. SHEET

SAFETY PRECAUTIONS

IMPORTANT SAFETY NOTICE

Many electrical and mechanical parts in this chassis have special safety-related characteristics. These parts are identified by ⚠ in the Schematic Diagram and Exploded View.

It is essential that these special safety parts should be replaced with the same components as recommended in this manual to prevent Shock, Fire, or other Hazards.

Do not modify the original design without permission of manufacturer.

General Guidance

An **isolation Transformer** should always be used during the servicing of a receiver whose chassis is not isolated from the AC power line. Use a transformer of adequate power rating as this protects the technician from accidents resulting in personal injury from electrical shocks.

It will also protect the receiver and its components from being damaged by accidental shorts of the circuitry that may be inadvertently introduced during the service operation.

If any fuse (or Fusible Resistor) in this TV receiver is blown, replace it with the specified.

When replacing a high wattage resistor (Oxide Metal Film Resistor, over 1W), keep the resistor 10mm away from PCB.

Keep wires away from high voltage or high temperature parts.

Before returning the receiver to the customer,

always perform an **AC leakage current check** on the exposed metallic parts of the cabinet, such as antennas, terminals, etc., to be sure the set is safe to operate without damage of electrical shock.

Leakage Current Cold Check(Antenna Cold Check)

With the instrument AC plug removed from AC source, connect an electrical jumper across the two AC plug prongs. Place the AC switch in the on position, connect one lead of ohm-meter to the AC plug prongs tied together and touch other ohm-meter lead in turn to each exposed metallic parts such as antenna terminals, phone jacks, etc.

If the exposed metallic part has a return path to the chassis, the measured resistance should be between $1M\Omega$ and $5.2M\Omega$.

When the exposed metal has no return path to the chassis the reading must be infinite.

An other abnormality exists that must be corrected before the receiver is returned to the customer.

Leakage Current Hot Check (See below Figure)

Plug the AC cord directly into the AC outlet.

Do not use a line Isolation Transformer during this check.

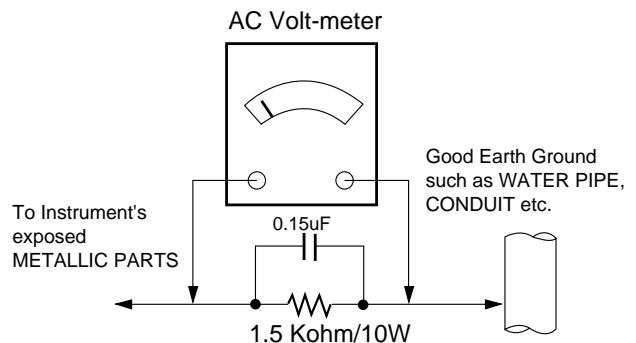
Connect 1.5K/10watt resistor in parallel with a 0.15uF capacitor between a known good earth ground (Water Pipe, Conduit, etc.) and the exposed metallic parts.

Measure the AC voltage across the resistor using AC voltmeter with 1000 ohms/volt or more sensitivity.

Reverse plug the AC cord into the AC outlet and repeat AC voltage measurements for each exposed metallic part. Any voltage measured must not exceed 0.75 volt RMS which corresponds to 0.5mA.

In case any measurement is out of the limits specified, there is possibility of shock hazard and the set must be checked and repaired before it is returned to the customer.

Leakage Current Hot Check circuit



SERVICING PRECAUTIONS

CAUTION: Before servicing receivers covered by this service manual and its supplements and addenda, read and follow the **SAFETY PRECAUTIONS** on page 3 of this publication.

NOTE: If unforeseen circumstances create conflict between the following servicing precautions and any of the safety precautions on page 3 of this publication, always follow the safety precautions. Remember: Safety First.

General Servicing Precautions

1. Always unplug the receiver AC power cord from the AC power source before;
 - a. Removing or reinstalling any component, circuit board module or any other receiver assembly.
 - b. Disconnecting or reconnecting any receiver electrical plug or other electrical connection.
 - c. Connecting a test substitute in parallel with an electrolytic capacitor in the receiver.

CAUTION: A wrong part substitution or incorrect polarity installation of electrolytic capacitors may result in an explosion hazard.

2. Test high voltage only by measuring it with an appropriate high voltage meter or other voltage measuring device (DVM, FETVOM, etc) equipped with a suitable high voltage probe. Do not test high voltage by "drawing an arc".
3. Do not spray chemicals on or near this receiver or any of its assemblies.
4. Unless specified otherwise in this service manual, clean electrical contacts only by applying the following mixture to the contacts with a pipe cleaner, cotton-tipped stick or comparable non-abrasive applicator; 10% (by volume) Acetone and 90% (by volume) isopropyl alcohol (90%-99% strength)
CAUTION: This is a flammable mixture.
Unless specified otherwise in this service manual, lubrication of contacts is not required.
5. Do not defeat any plug/socket B+ voltage interlocks with which receivers covered by this service manual might be equipped.
6. Do not apply AC power to this instrument and/or any of its electrical assemblies unless all solid-state device heat sinks are correctly installed.
7. Always connect the test receiver ground lead to the receiver chassis ground before connecting the test receiver positive lead.
Always remove the test receiver ground lead last.
8. *Use with this receiver only the test fixtures specified in this service manual.*

CAUTION: Do not connect the test fixture ground strap to any heat sink in this receiver.

Electrostatically Sensitive (ES) Devices

Some semiconductor (solid-state) devices can be damaged easily by static electricity. Such components commonly are called *Electrostatically Sensitive (ES) Devices*. Examples of typical ES devices are integrated circuits and some field-effect transistors and semiconductor "chip" components. The following techniques should be used to help reduce the incidence of component damage caused by static by static electricity.

1. Immediately before handling any semiconductor component or semiconductor-equipped assembly, drain off any electrostatic charge on your body by touching a known earth ground. Alternatively, obtain and wear a commercially available discharging wrist strap device, which should be removed to prevent potential shock reasons prior to applying power to the

unit under test.

2. After removing an electrical assembly equipped with ES devices, place the assembly on a conductive surface such as aluminum foil, to prevent electrostatic charge buildup or exposure of the assembly.
3. Use only a grounded-tip soldering iron to solder or unsolder ES devices.
4. Use only an anti-static type solder removal device. Some solder removal devices not classified as "anti-static" can generate electrical charges sufficient to damage ES devices.
5. Do not use freon-propelled chemicals. These can generate electrical charges sufficient to damage ES devices.
6. Do not remove a replacement ES device from its protective package until immediately before you are ready to install it. (Most replacement ES devices are packaged with leads electrically shorted together by conductive foam, aluminum foil or comparable conductive material).
7. Immediately before removing the protective material from the leads of a replacement ES device, touch the protective material to the chassis or circuit assembly into which the device will be installed.
CAUTION: Be sure no power is applied to the chassis or circuit, and observe all other safety precautions.
8. Minimize bodily motions when handling unpackaged replacement ES devices. (Otherwise harmless motion such as the brushing together of your clothes fabric or the lifting of your foot from a carpeted floor can generate static electricity sufficient to damage an ES device.)

General Soldering Guidelines

1. Use a grounded-tip, low-wattage soldering iron and appropriate tip size and shape that will maintain tip temperature within the range or 500°F to 600°F.
2. Use an appropriate gauge of RMA resin-core solder composed of 60 parts tin/40 parts lead.
3. Keep the soldering iron tip clean and well tinned.
4. Thoroughly clean the surfaces to be soldered. Use a mall wire-bristle (0.5 inch, or 1.25cm) brush with a metal handle. Do not use freon-propelled spray-on cleaners.
5. Use the following unsoldering technique
 - a. Allow the soldering iron tip to reach normal temperature. (500°F to 600°F)
 - b. Heat the component lead until the solder melts.
 - c. Quickly draw the melted solder with an anti-static, suction-type solder removal device or with solder braid.
CAUTION: Work quickly to avoid overheating the circuit board printed foil.
6. Use the following soldering technique.
 - a. Allow the soldering iron tip to reach a normal temperature (500°F to 600°F)
 - b. First, hold the soldering iron tip and solder the strand against the component lead until the solder melts.
 - c. Quickly move the soldering iron tip to the junction of the component lead and the printed circuit foil, and hold it there only until the solder flows onto and around both the component lead and the foil.
CAUTION: Work quickly to avoid overheating the circuit board printed foil.
 - d. Closely inspect the solder area and remove any excess or splashed solder with a small wire-bristle brush.

IC Remove/Replacement

Some chassis circuit boards have slotted holes (oblong) through which the IC leads are inserted and then bent flat against the circuit foil. When holes are the slotted type, the following technique should be used to remove and replace the IC. When working with boards using the familiar round hole, use the standard technique as outlined in paragraphs 5 and 6 above.

Removal

1. Desolder and straighten each IC lead in one operation by gently prying up on the lead with the soldering iron tip as the solder melts.
2. Draw away the melted solder with an anti-static suction-type solder removal device (or with solder braid) before removing the IC.

Replacement

1. Carefully insert the replacement IC in the circuit board.
2. Carefully bend each IC lead against the circuit foil pad and solder it.
3. Clean the soldered areas with a small wire-bristle brush. (It is not necessary to reapply acrylic coating to the areas).

"Small-Signal" Discrete Transistor

Removal/Replacement

1. Remove the defective transistor by clipping its leads as close as possible to the component body.
2. Bend into a "U" shape the end of each of three leads remaining on the circuit board.
3. Bend into a "U" shape the replacement transistor leads.
4. Connect the replacement transistor leads to the corresponding leads extending from the circuit board and crimp the "U" with long nose pliers to insure metal to metal contact then solder each connection.

Power Output, Transistor Device

Removal/Replacement

1. Heat and remove all solder from around the transistor leads.
2. Remove the heat sink mounting screw (if so equipped).
3. Carefully remove the transistor from the heat sink of the circuit board.
4. Insert new transistor in the circuit board.
5. Solder each transistor lead, and clip off excess lead.
6. Replace heat sink.

Diode Removal/Replacement

1. Remove defective diode by clipping its leads as close as possible to diode body.
2. Bend the two remaining leads perpendicular y to the circuit board.
3. Observing diode polarity, wrap each lead of the new diode around the corresponding lead on the circuit board.
4. Securely crimp each connection and solder it.
5. Inspect (on the circuit board copper side) the solder joints of the two "original" leads. If they are not shiny, reheat them and if necessary, apply additional solder.

Fuse and Conventional Resistor

Removal/Replacement

1. Clip each fuse or resistor lead at top of the circuit board hollow stake.
2. Securely crimp the leads of replacement component around notch at stake top.
3. Solder the connections.

CAUTION: Maintain original spacing between the replaced component and adjacent components and the circuit board to prevent excessive component temperatures.

Circuit Board Foil Repair

Excessive heat applied to the copper foil of any printed circuit board will weaken the adhesive that bonds the foil to the circuit board causing the foil to separate from or "lift-off" the board. The following guidelines and procedures should be followed whenever this condition is encountered.

At IC Connections

To repair a defective copper pattern at IC connections use the following procedure to install a jumper wire on the copper pattern side of the circuit board. (Use this technique only on IC connections).

1. Carefully remove the damaged copper pattern with a sharp knife. (Remove only as much copper as absolutely necessary).
2. Carefully scratch away the solder resist and acrylic coating (if used) from the end of the remaining copper pattern.
3. Bend a small "U" in one end of a small gauge jumper wire and carefully crimp it around the IC pin. Solder the IC connection.
4. Route the jumper wire along the path of the out-away copper pattern and let it overlap the previously scraped end of the good copper pattern. Solder the overlapped area and clip off any excess jumper wire.

At Other Connections

Use the following technique to repair the defective copper pattern at connections other than IC Pins. This technique involves the installation of a jumper wire on the component side of the circuit board.

1. Remove the defective copper pattern with a sharp knife. Remove at least 1/4 inch of copper, to ensure that a hazardous condition will not exist if the jumper wire opens.
2. Trace along the copper pattern from both sides of the pattern break and locate the nearest component that is directly connected to the affected copper pattern.
3. Connect insulated 20-gauge jumper wire from the lead of the nearest component on one side of the pattern break to the lead of the nearest component on the other side. Carefully crimp and solder the connections.

CAUTION: Be sure the insulated jumper wire is dressed so the it does not touch components or sharp edges.

SPECIFICATION

NOTE : Specifications and others are subject to change without notice for improvement.

1. Application range

This spec sheet is applied LCD TV with 32", 37", 42", 47", 55"
LA01U chassis.

2. Requirement for Test

Each part is tested as below without special appointment.

- 1) Temperature: 25 °C \pm 5 °C
- 2) Relative Humidity: 65 \pm 10 %
- 3) Power Voltage : Standard input voltage(100-240V~, 50/60Hz)
* Standard Voltage of each product is marked by models
- 4) Specification and performance of each parts are followed
each drawing and specification by part number in
accordance with BOM.
- 5) The receiver must be operated for about 5 minutes prior to
the adjustment.

3. Test method

- 1) Performance: LGE TV test method followed
- 2) Demanded other specification
 - Safety : UL, CSA, IEC specification
 - EMC: FCC, ICES, IEC specification

4. General Specification(TV)

No	Item	Specification		Remark
1	Receivable System	1) ATSC / NTSC-M		
2	Available Channel	1) VHF : 02 ~ 13 2) UHF : 14 ~ 69 3) DTV : 02 ~ 69 4) CATV : 01 ~ 135 5) CADTV : 01 ~ 135		
3	Input Voltage	1) AC 100 - 240V~ 50/60Hz		Mark : 110V, 60Hz (N.Ame)
4	Market	North America		
5	Screen Size	42 inch Wide(1920x1080)	FHD + 120Hz	42LK520-UA
		47 inch Wide(1920x1080)	FHD + 120Hz	47LK520-UA
		55 inch Wide(1920x1080)	FHD + 120Hz	55LK520-UA
6	Aspect Ratio	16:9		
7	Tuning System	FS		
8	LCD Module	LC420WUF-SCA2	LGD	42LK520-UA
		LC470WUF-SCA2	LGD	47LK520-UA
		LC550WUD-SCA2	LGD	55LK520-UA
9	Operating Environment	Temp : 0 ~ 40 deg Humidity : ~ 80 %		
10	Storage Environment	Temp : -20 ~ 60 deg Humidity : -85 %		

5. Chrominance & Luminance

No.	Item			Min	Typ	Max	Unit	Remarks
1	Max Luminance (Center 1-point / Full White Pattern)			360	500		cd/m ²	
2	Luminance uniformity							
3	Color coordinate (Default)	RED	X	Typ. -0.03	0.636	Typ. +0.03		42LK520-UA(LGD)
			Y		0.335			
		GREEN	X		0.291			
			Y		0.603			
		BLUE	X		0.146			
			Y		0.061			
		WHITE	X		0.279			
			Y		0.292			
		RED	X	Typ. -0.03	0.639	Typ. +0.03		47LK520-UA(LGD)
			Y		0.334			
		GREEN	X		0.290			
			Y		0.606			
		BLUE	X		0.146			
			Y		0.058			
		WHITE	X		0.279			
			Y		0.292			
		RED	X	Typ. -0.03	0.637	Typ. +0.03		55LK520-UA(LGD)
			Y		0.333			
		GREEN	X		0.287			
			Y		0.605			
		BLUE	X		0.145			
			Y		0.064			
		WHITE	X		0.279			
			Y		0.292			
4	Contrast ratio	Module		1100	1450			47/55LK520-UA(LGD)
				1100	1500			42LK520-UA(LGD)
		DCR		130,000:1	150,000:1			42/47/55LK520-UA(LGD)
6	Color Temperature	Cool		0.254	0.269	0.284	13000K	The W/B Tolerance is ±0.015 for picture quality by DQA
				0.258	0.273	0.288		
		Medium		0.270	0.285	0.300	9300K	
				0.278	0.293	0.308		
		Warm		0.298	0.313	0.324	6500K	
				0.314	0.329	0.344		

6. Component Video Input (Y, CB/PB, CR/PR)

No	Resolution	H-freq(kHz)	V-freq.(kHz)	Pixel clock	Proposed
1.	720*480	15.73	60	13.5135	SDTV ,DVD 480I
2.	720*480	15.73	59.94	13.5	SDTV ,DVD 480I
3.	720*480	31.50	60	27.027	SDTV 480P
4.	720*480	31.47	59.94	27.0	SDTV 480P
5.	1280*720	45.00	60.00	74.25	HDTV 720P
6.	1280*720	44.96	59.94	74.176	HDTV 720P
7.	1920*1080	33.75	60.00	74.25	HDTV 1080I
8.	1920*1080	33.72	59.94	74.176	HDTV 1080I
9.	1920*1080	67.500	60	148.50	HDTV 1080P
10.	1920*1080	67.432	59.94	148.352	HDTV 1080P
11.	1920*1080	27.000	24.000	74.25	HDTV 1080P
12.	1920*1080	26.97	23.976	74.176	HDTV 1080P
13.	1920*1080	33.75	30.000	74.25	HDTV 1080P
14.	1920*1080	33.71	29.97	74.0176	HDTV 1080P

7. RGB Input (PC)

No	Resolution	H-freq(kHz)	V-freq.(kHz)	Pixel clock	Proposed	
	PC					DDC
1.	640*350	31.468	70.09	25.17	EGA	X
2.	720*400	31.469	70.08	28.32	DOS	O
3.	640*480	31.469	59.94	25.17	VESA(VGA)	O
4.	800*600	37.879	60.31	40.00	VESA(SVGA)	O
5.	1024*768	48.363	60.00	65.00	VESA(XGA)	O
6.	1280*768	47.776	59.870	79.5	CVT(WXGA)	X
7.	1360*768	47.712	60.015	85.50	VESA(WXGA)	X
8.	1280*1024	63.981	60.020	108.00	VESA(SXGA)	O
9.	1920*1080	66.587	59.934	138.50	WUXGA	O

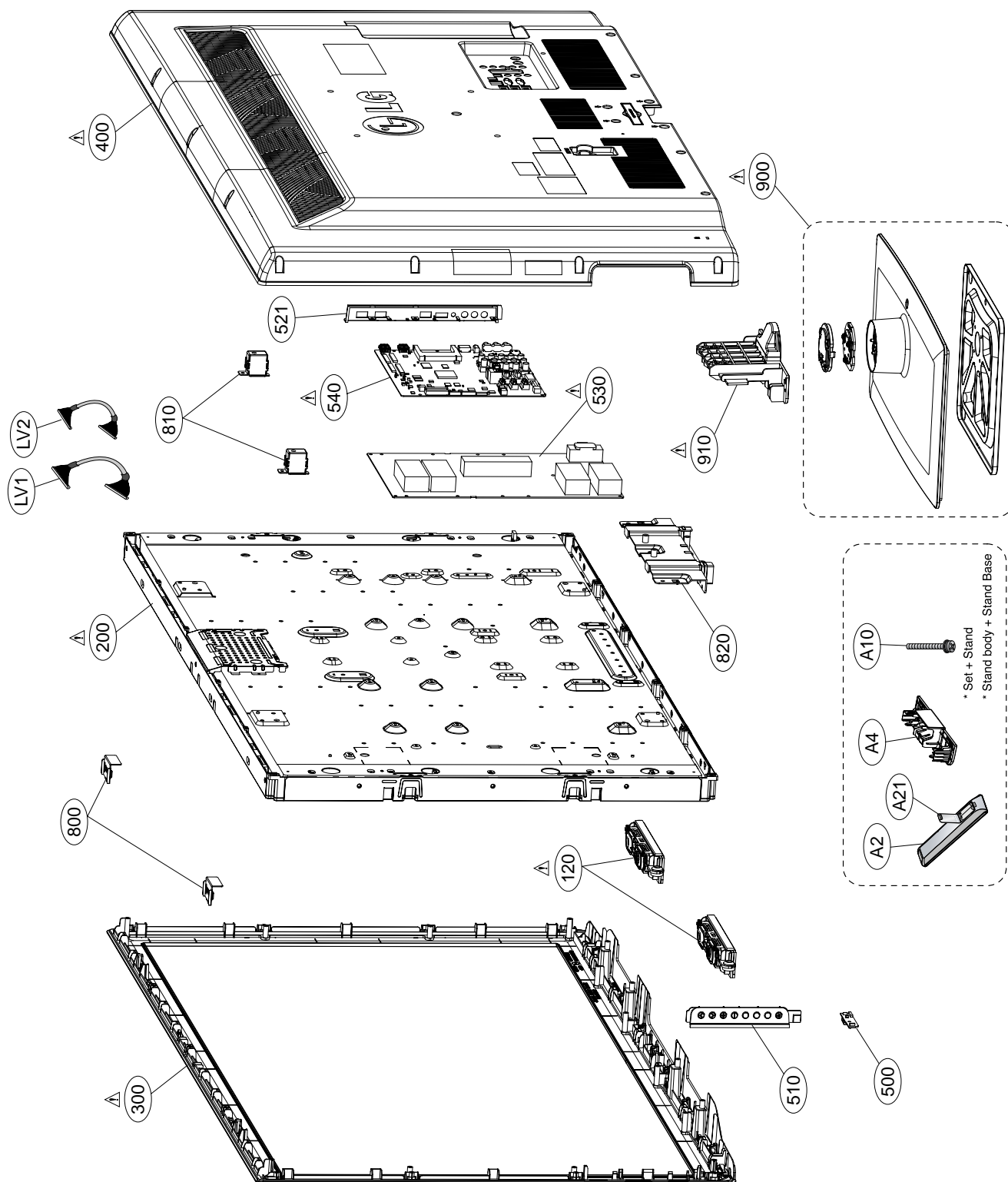
8. HDMI input (PC/DTV)

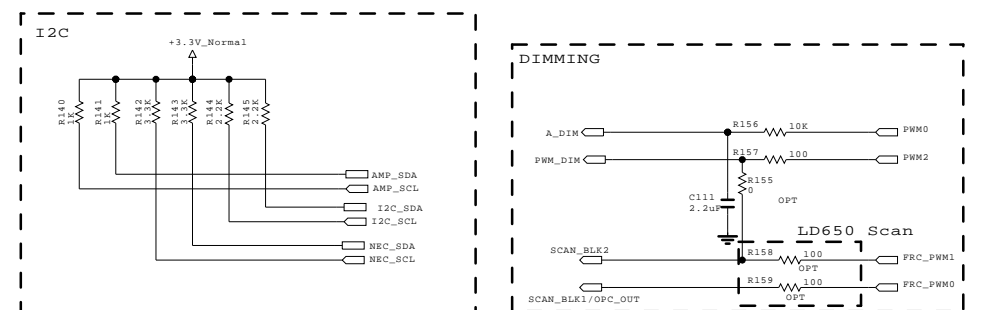
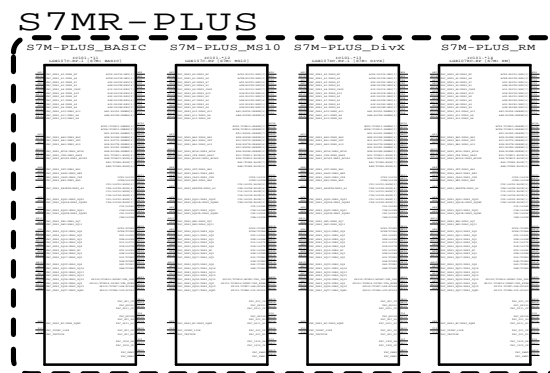
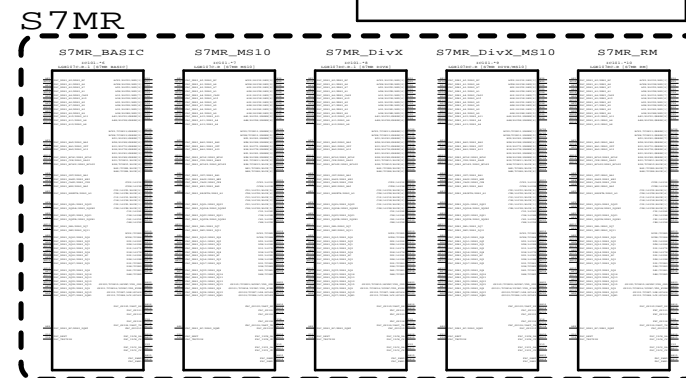
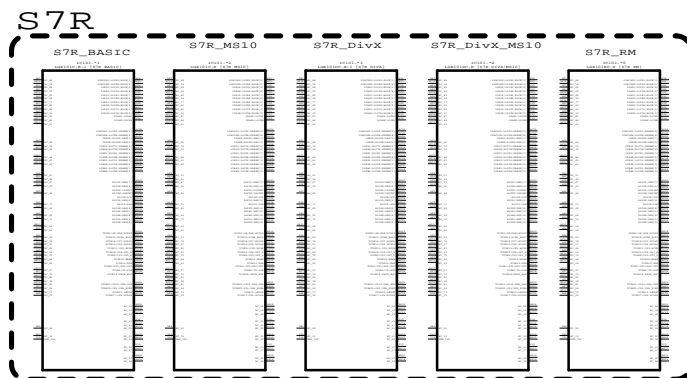
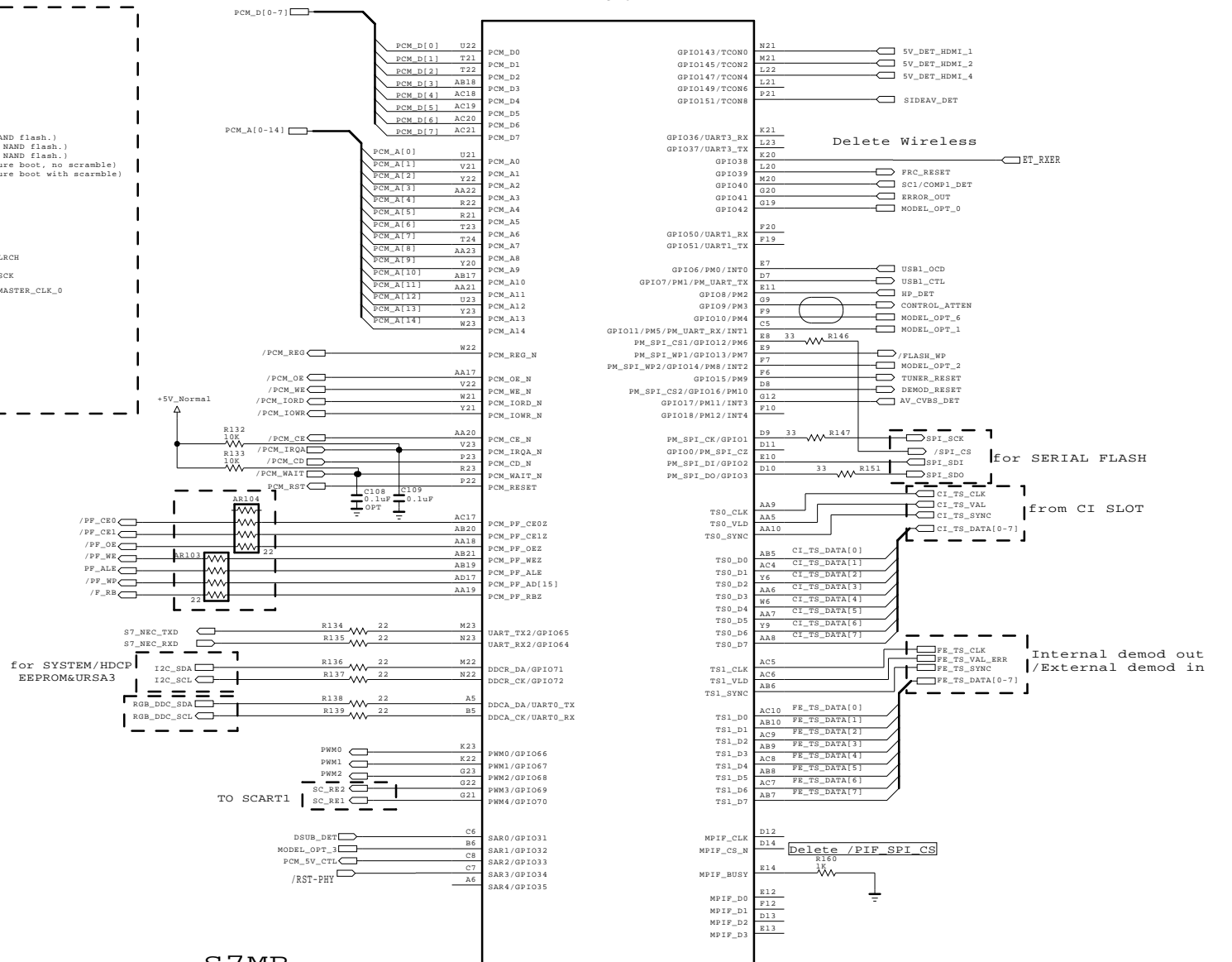
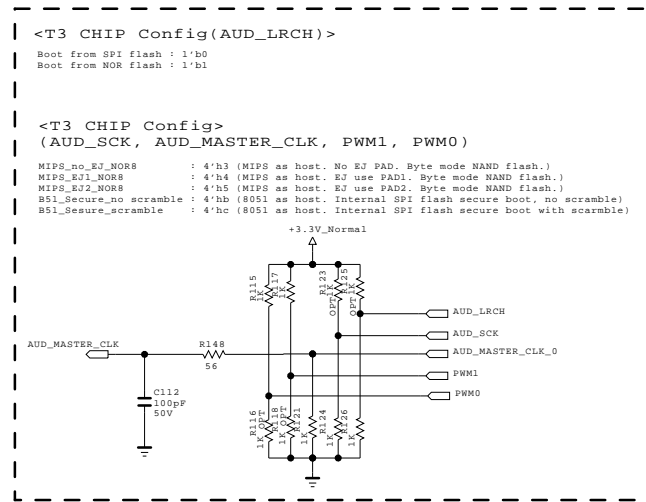
No	Resolution	H-freq(kHz)	V-freq.(kHz)	Pixel clock	Proposed	
	PC					DDC
1.	640*350	31.468	70.09	25.17	EGA	X
2.	720*400	31.469	70.08	28.32	DOS	O
3.	640*480	31.469	59.94	25.17	VESA(VGA)	X
4.	800*600	37.879	60.31	40.00	VESA(SVGA)	O
5.	1024*768	48.363	60.00	65.00	VESA(XGA)	O
6.	1360*768	47.712	60.015	85.50	VESA (WXGA)	O
7.	1280*1024	63.981	60.020	108.00	VESA (SXGA)	O
8.	1920*1080	67.500	60.000	148.50	HDTV 1080P	O
	DTV					
1	720*480	31.47	60	27.027	SDTV 480P	O
2	720*480	31.47	59.94	27.00	SDTV 480P	O
3	1280*720	45.00	60.00	74.25	HDTV 720P	O
4	1280*720	44.96	59.94	74.176	HDTV 720P	O
5	1920*1080	33.75	60.00	74.25	HDTV 1080I	O
6	1920*1080	33.72	59.94	74.176	HDTV 1080I	O
7	1920*1080	67.500	60	148.50	HDTV 1080P	O
8	1920*1080	67.432	59.939	148.352	HDTV 1080P	O
9	1920*1080	27.000	24.000	74.25	HDTV 1080P	O
10	1920*1080	26.97	23.976	74.176	HDTV 1080P	O
11	1920*1080	33.75	30.000	74.25	HDTV 1080P	O
12	1920*1080	33.71	29.97	74.176	HDTV 1080P	O

EXPLODED VIEW

IMPORTANT SAFETY NOTICE

Many electrical and mechanical parts in this chassis have special safety-related characteristics. These parts are identified by Δ in the Schematic Diagram and EXPLODED VIEW. It is essential that these special safety parts should be replaced with the same components as recommended in this manual to prevent X-RADIATION, Shock, Fire, or other Hazards. Do not modify the original design without permission of manufacturer.

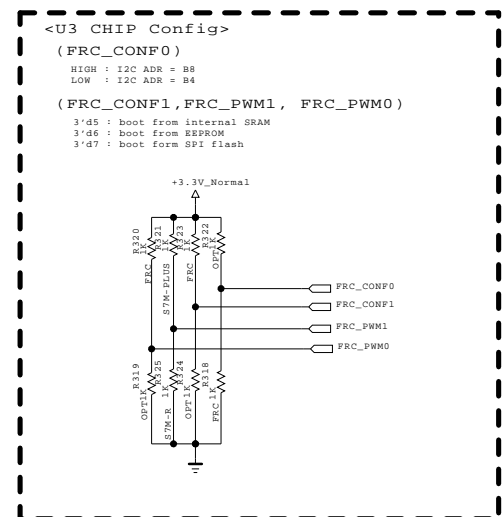
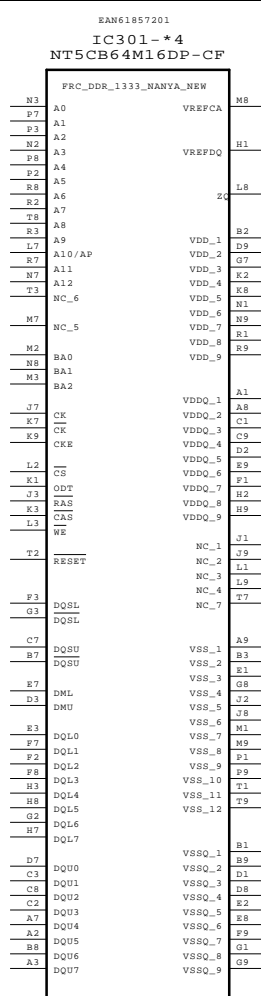
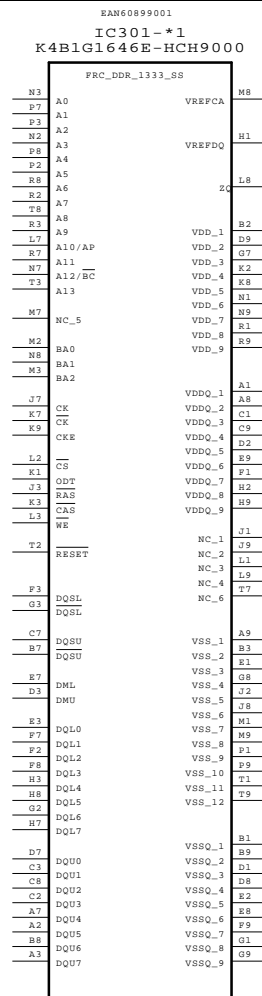
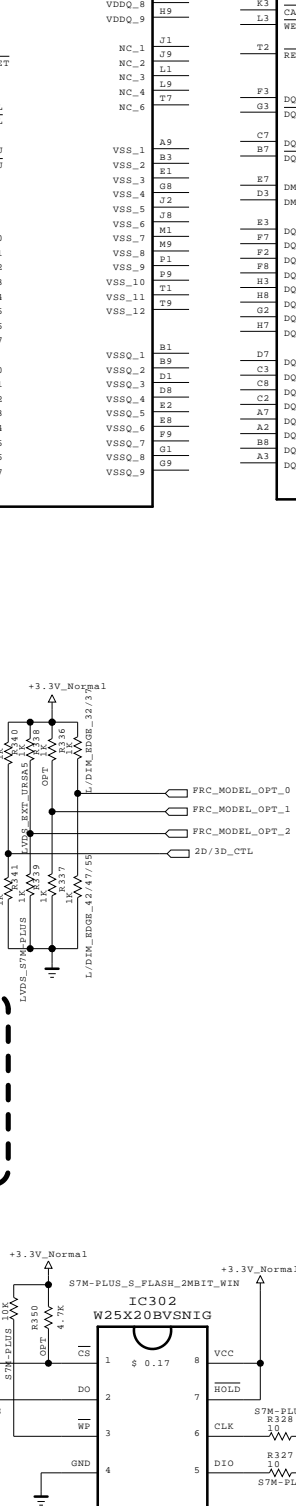
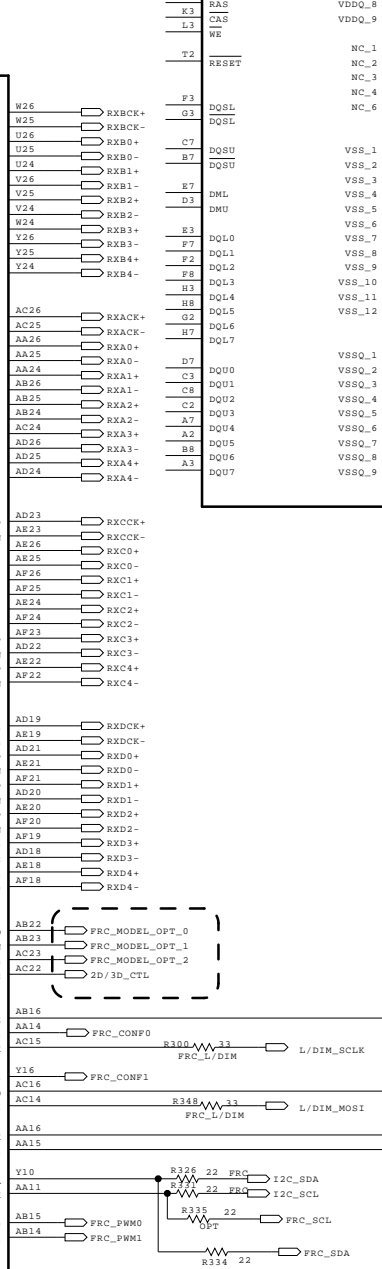
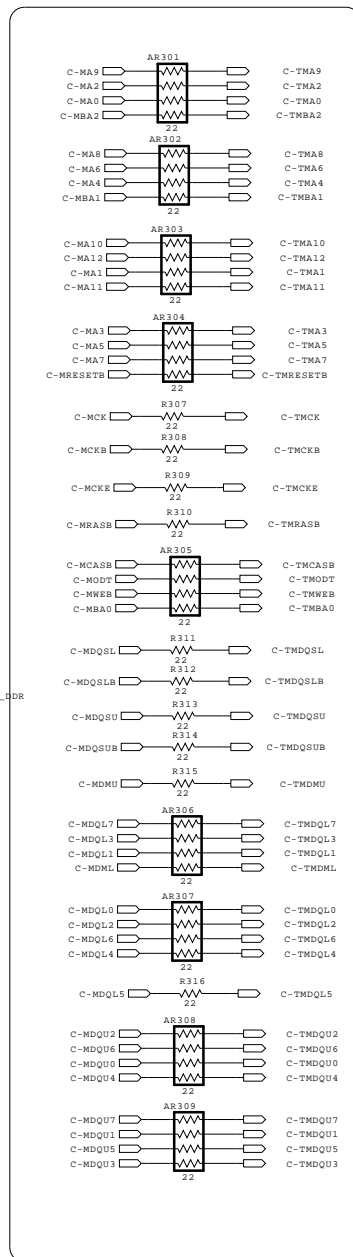
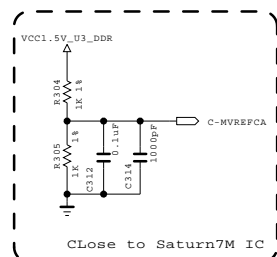
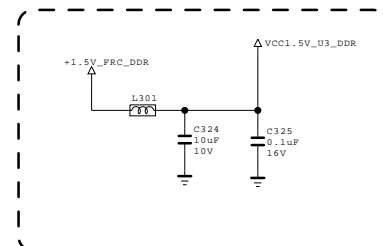




SECRET
LGElectronics



MODEL	GP3_Saturn7M	DATE	Ver. 0.1
BLOCK	FLASH/EEPROM/GPIO	SHEET	1 /

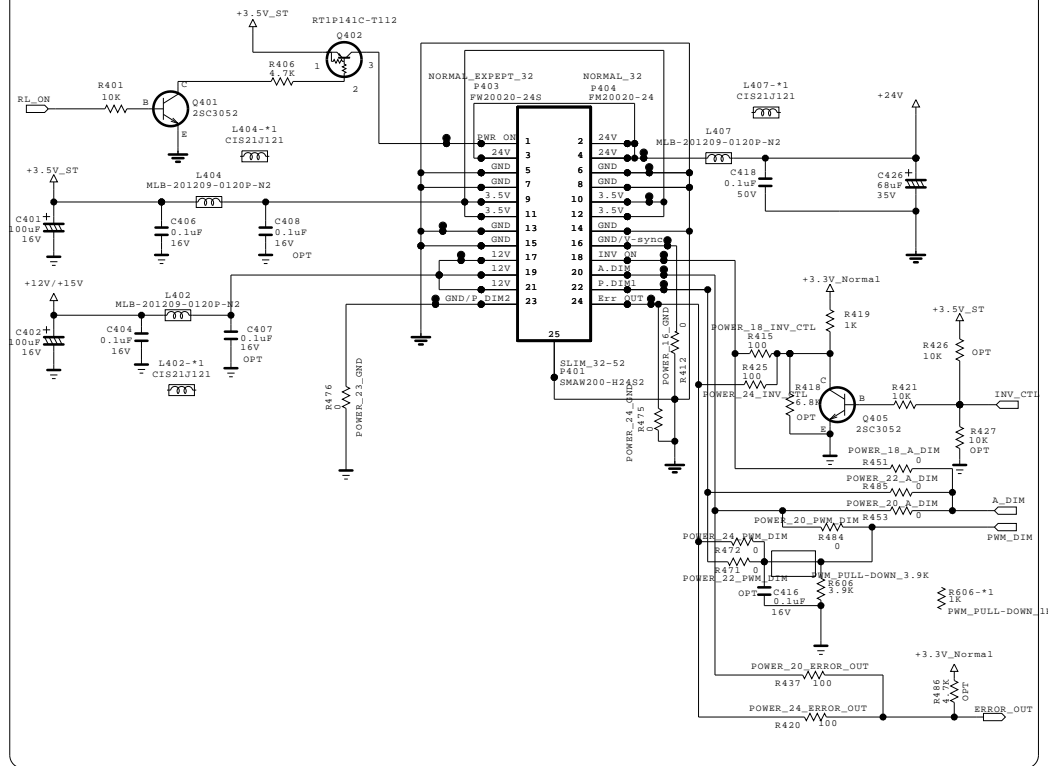


SECRET
LG Electronics



MODEL	GP2R	DATE	20101023
BLOCK	FRC_DDR	SHEET	3 /

FROM LIPS & POWER B/D



<MODULE PIN MAP>

PIN No	LGD (PSU) or LIPS	CMO10*Lamp (PSU)	A00 10*Lamp (PSU)	SHARP (PSU)	IPS-@ (PSU)
16	GND	GND	GND	GND	GND
18	INV_ON	A-DIM	INV_ON	INV_ON	INV_ON
20	VBR-A	NC	Err_out	52/60:ERROR 26/32HD:NC	Err_out
22	PWM_DIM	PWM_DIM	NC	26/32/52:PWM 60:NC	NC
24	Err_out	INV_ON	PWM_DIM	26/32/52:GND 60:PWM	PWM_DIM
23	GND	GND	GND	GND	GND

<LED MODULE PIN MAP -> latest update 20100618>

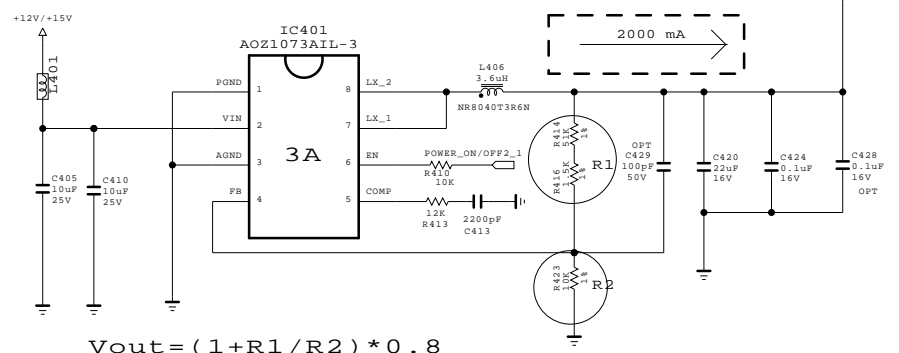
PIN No	LGD LPB/ OS LPB	32LRS300-TA CMO10*LED (PSU)	32LR4500-TA A00 10*LED (PSU)	32LRS300-TA LGD 10*LED (PSU)
16	NC	NC	NC	NC
18	INV_ON	INV_ON	INV_ON	INV_ON
20	NC	err_out	err_out	NC
22	PWM_DIM	NC	NC	PWM_DIM
24	err_out	PWM_DIM	PWM_DIM	err_out
23	NC	NC	NC	NC

LGD edge led error-out use or not? checking is necessary...

<Module Inv to Main Pin Connection>

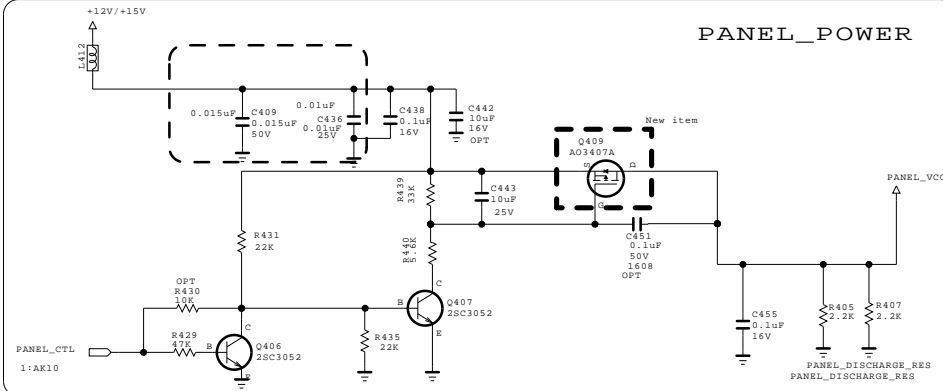
INV	<-->	MAIN
#11	<-->	#24
#12	<-->	#18
#13	<-->	#20
#14	<-->	#22

+5V_USB

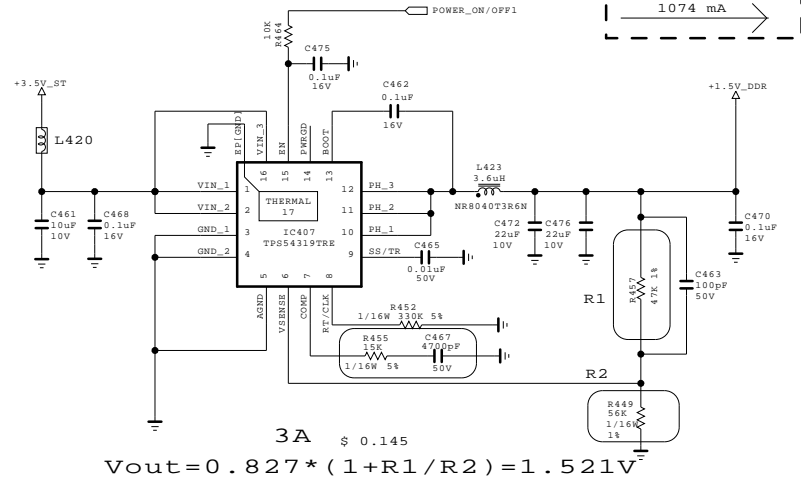


$$V_{out} = (1 + R1/R2) * 0.8$$

PANEL_POWER

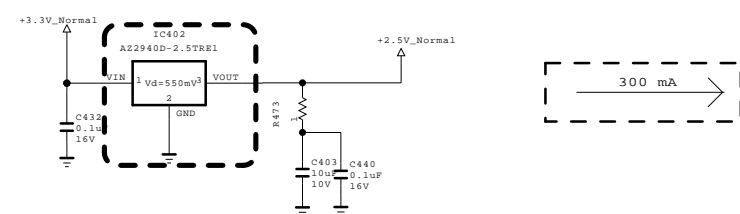


S7M DDR 1.5V

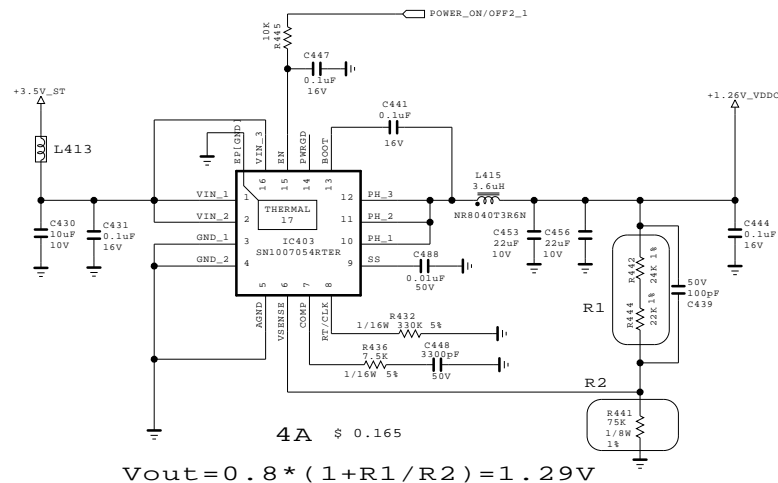


$$V_{out} = 0.827 * (1 + R1/R2) = 1.521V$$

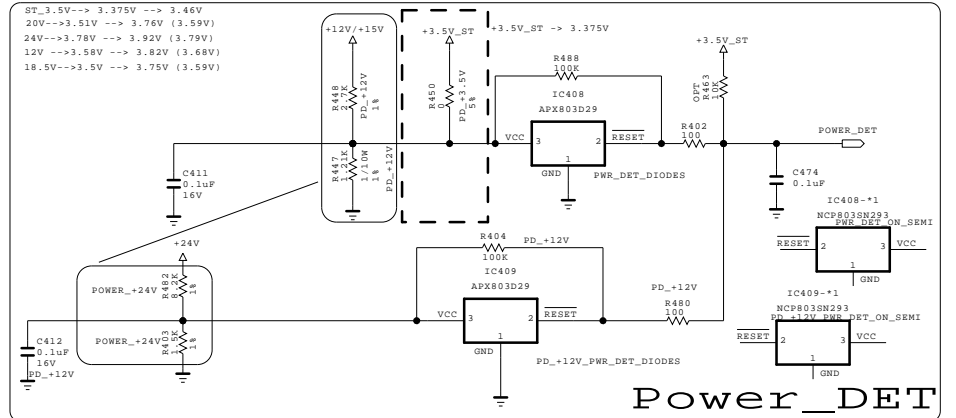
+2.5V/+1.8V



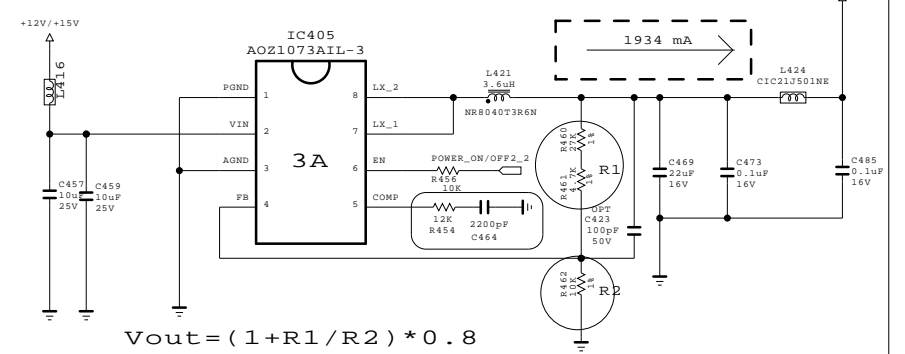
S7M core 1.26V volt



$$V_{out} = 0.8 * (1 + R1/R2) = 1.29V$$

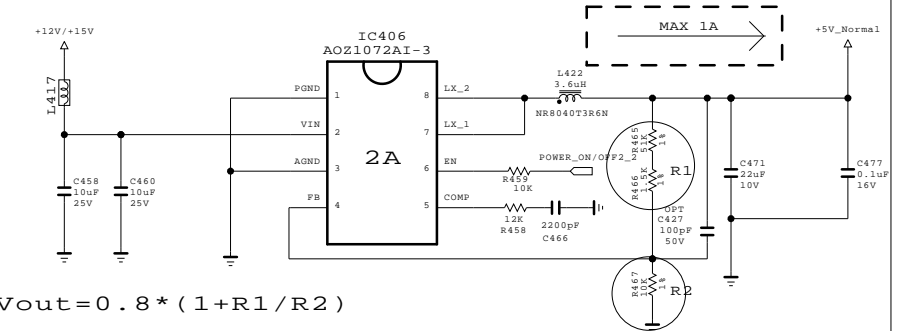


+3.3V_Normal

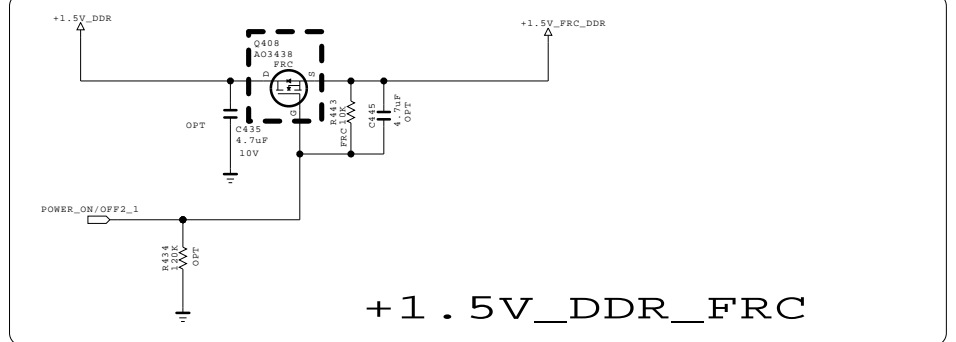


$$V_{out} = (1 + R1/R2) * 0.8$$

+5V_Normal



$$V_{out} = 0.8 * (1 + R1/R2)$$



+1.5V_DDR_FRC

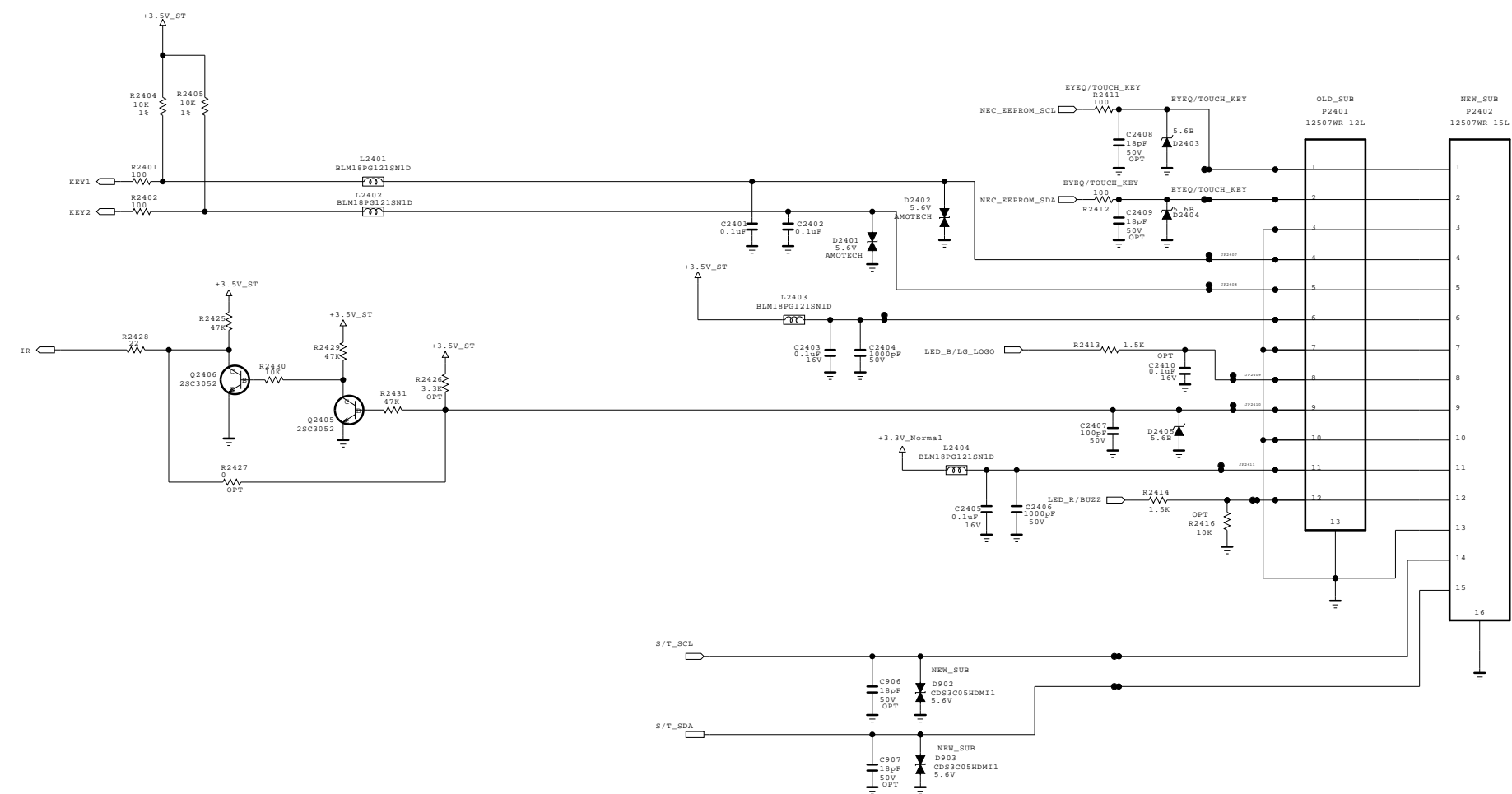
THE SYMBOL MARK OF THIS SCHEMATIC DIAGRAM INCORPORATES SPECIAL FEATURES IMPORTANT FOR PROTECTION FROM X-RADIATION. FILRE AND ELECTRICAL SHOCK HAZARDS, WHEN SERVICING IF IS ESSENTIAL THAT ONLY MANUFACTURES SPECIED PARTS BE USED FOR THE CRITICAL COMPONENTS IN THE SYMBOL MARK OF THE SCHEMATIC.



SECRET
LGElectronics

LG ELECTRONICS

MODEL	GP2R	DATE	20101023
BLOCK	POWER_LARGE	SHEET	4

CONTROL
IR & LED

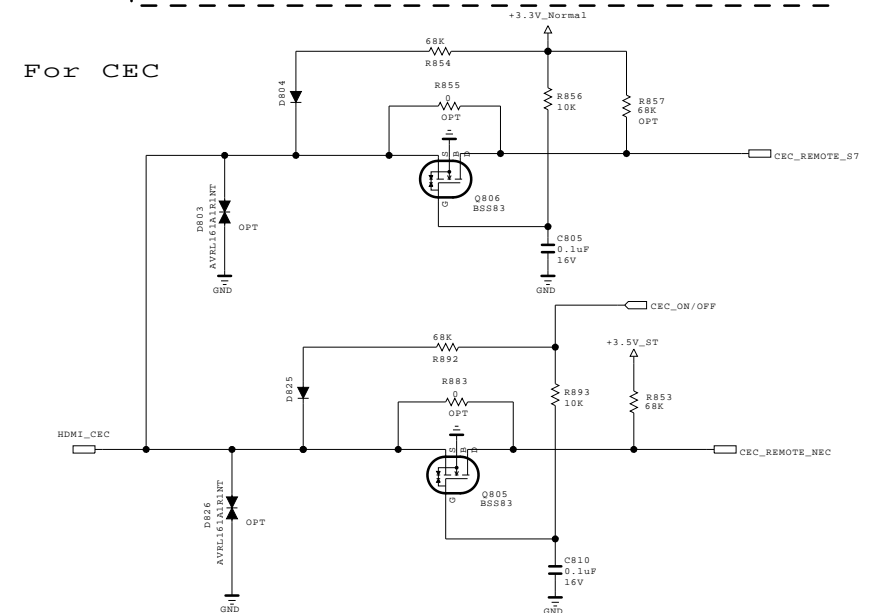
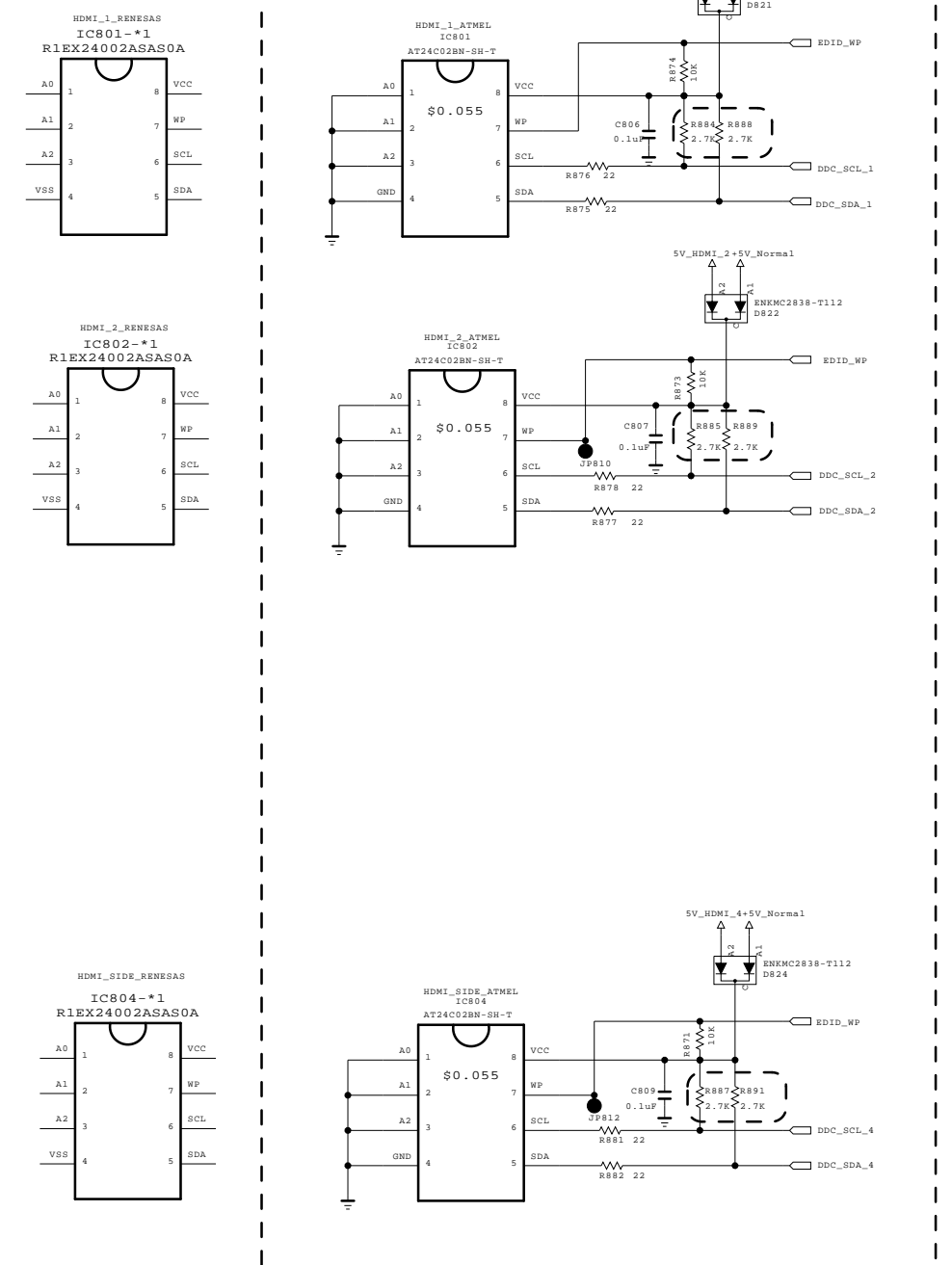
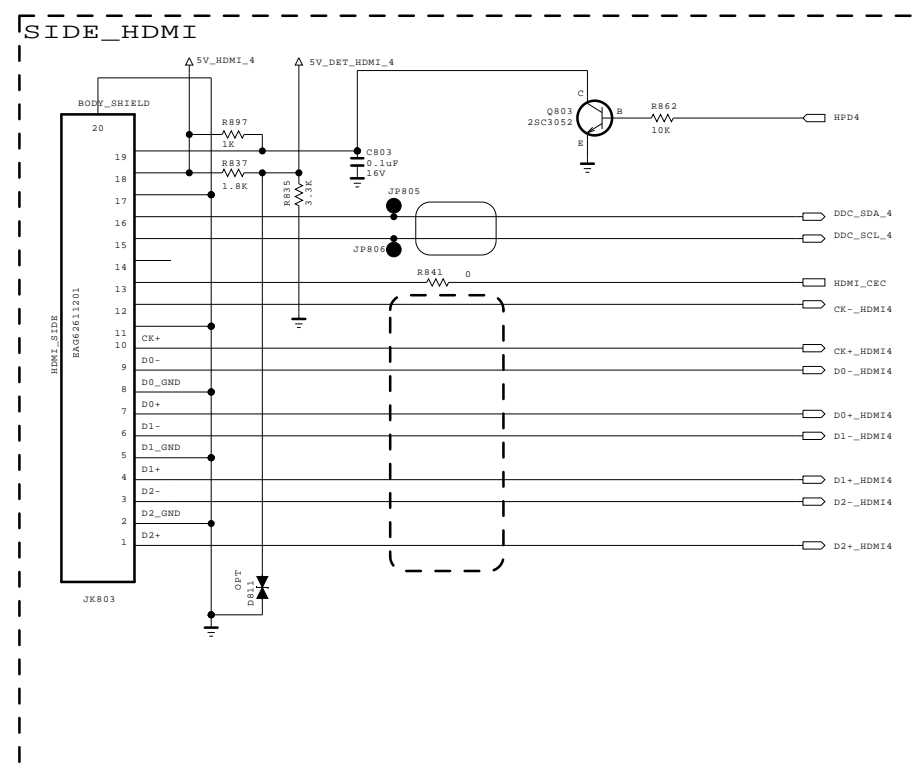
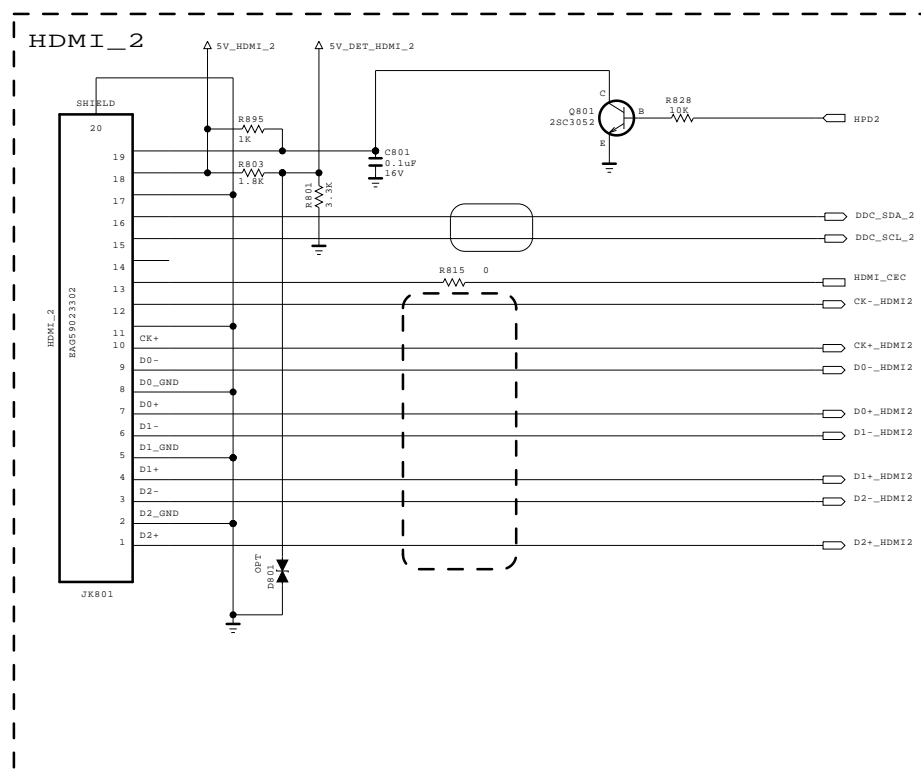


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SECRET
LGElectronics



MODEL	GP2R	DATE	20101023
BLOCK	IR / CONTROL-L	SHEET	6 /



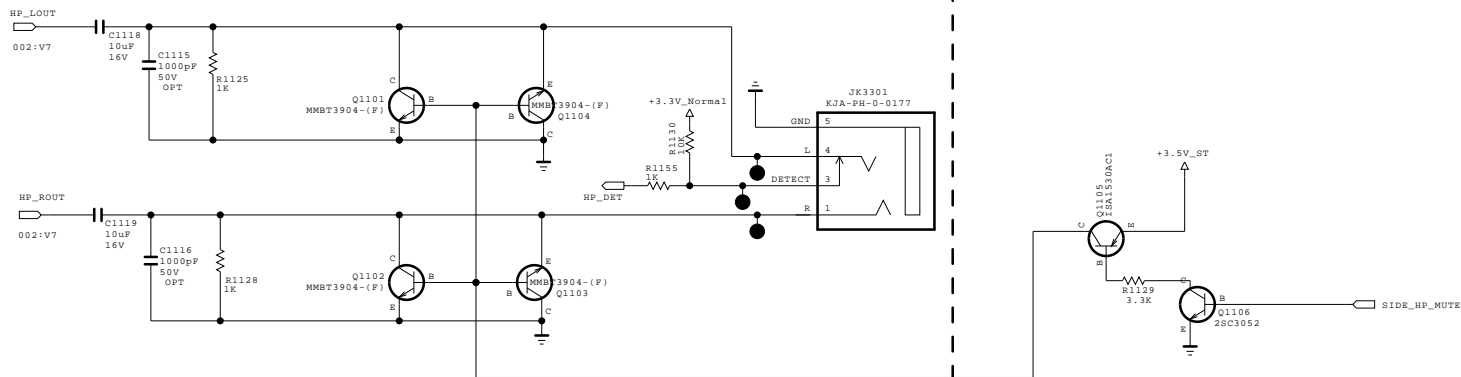
SECRET
LGElectronics



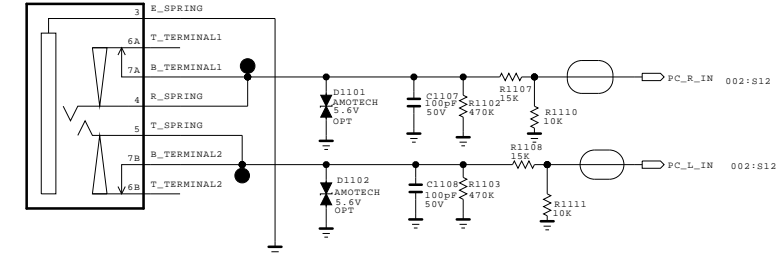
MODEL	GP2R	DATE	20101023
BLOCK	HDMI	SHEET	8 /

RGB / SPDIF / PC / HP

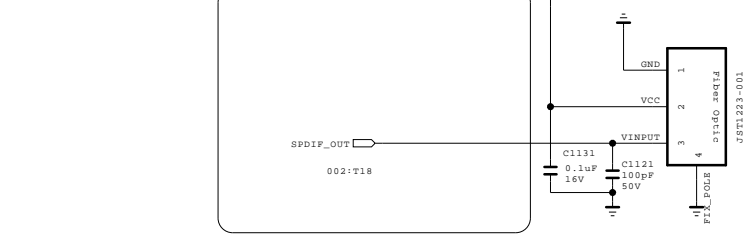
New Item Development
EARPHONE BLOCK



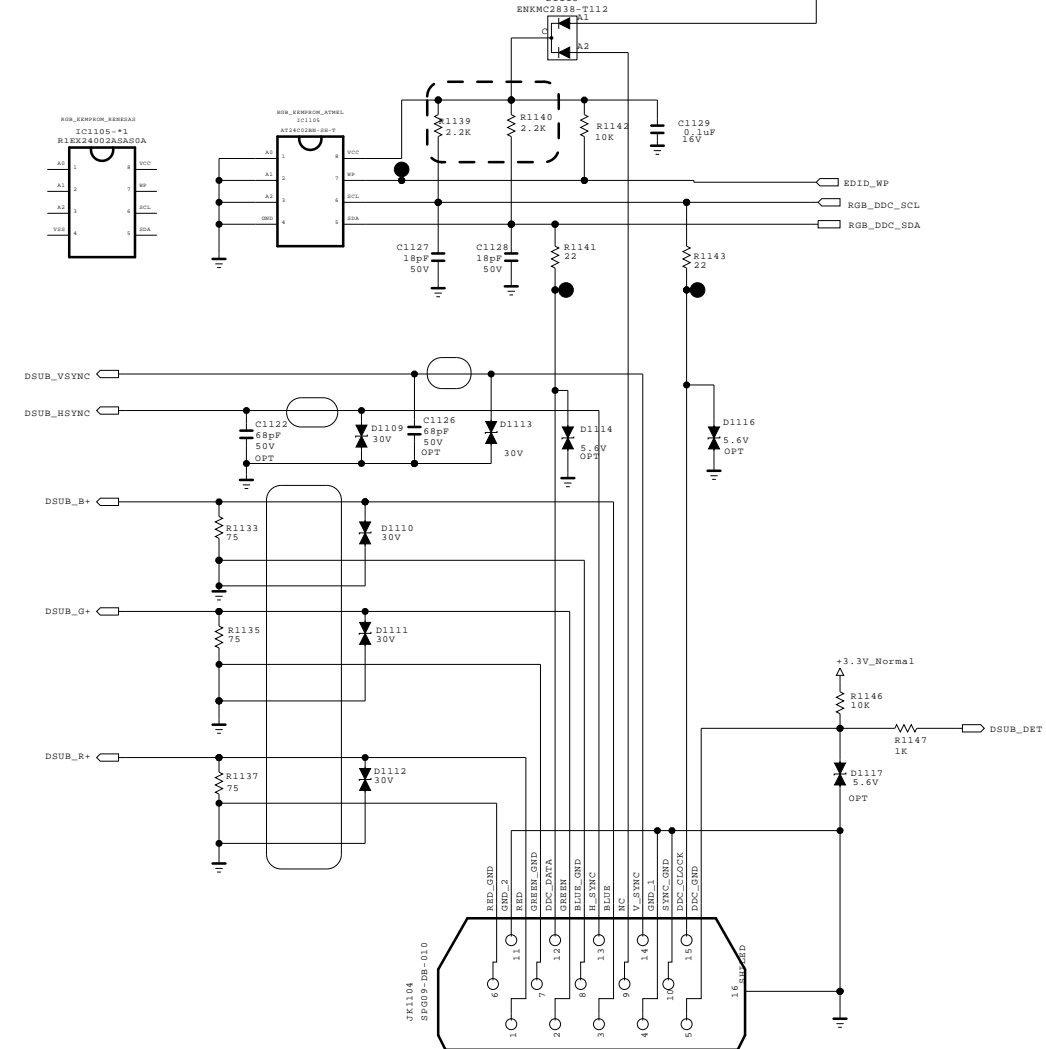
PC AUDIO
JK1102
PEJ027-01





SPDIF OPTIC JACK
5.15 Meter Circuit Application



RGB PC

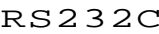


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SECRET
LGElectronics

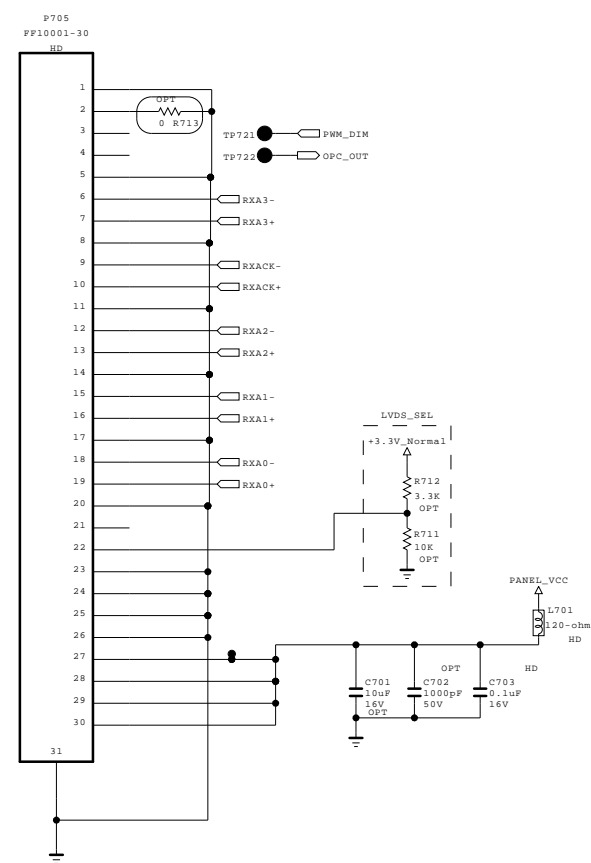
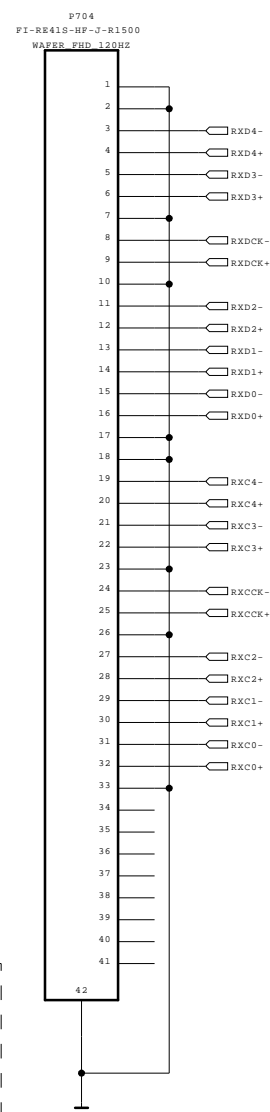
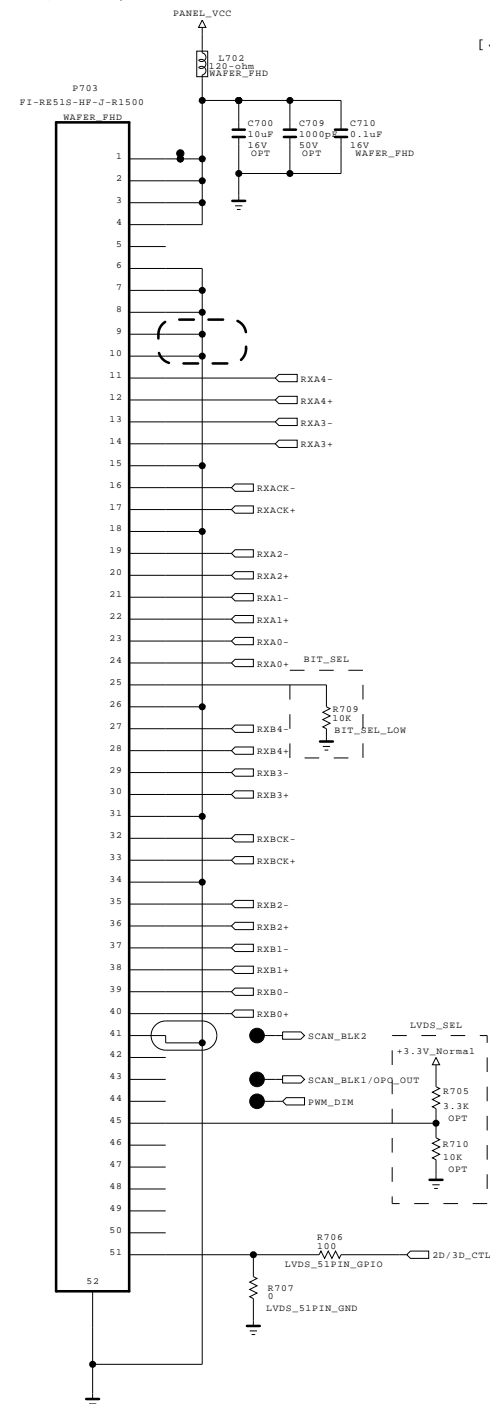


MODEL	GP2R	DATE	20101023
BLOCK	RGB / SPDIF / HP	SHEET	9 /



SECRET
LGElectronics

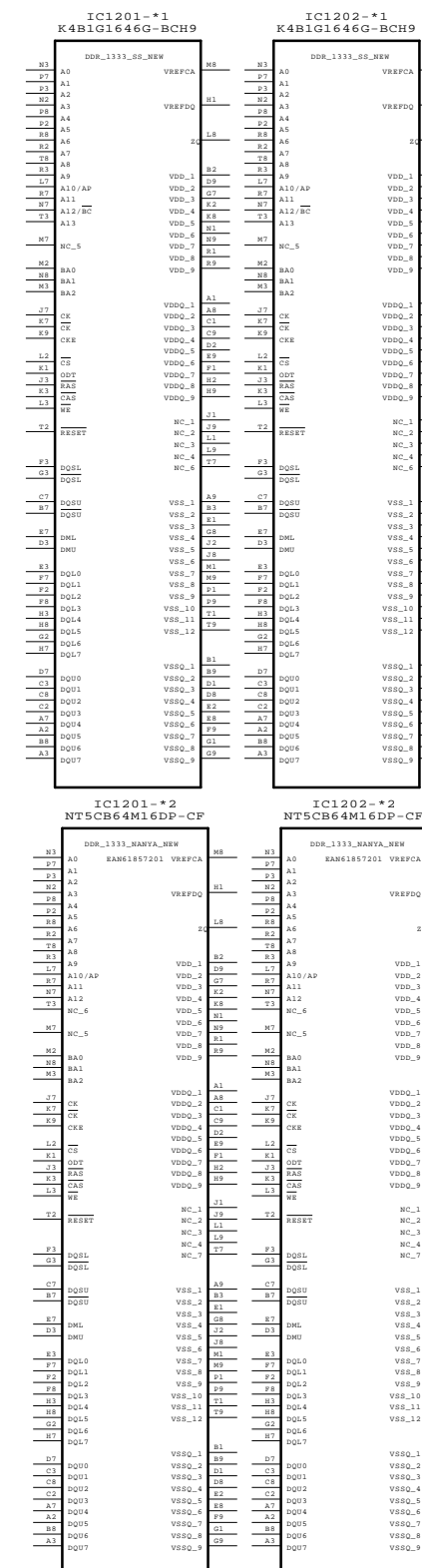
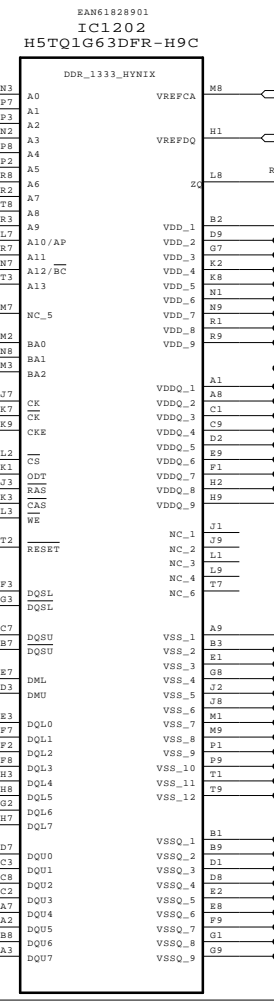
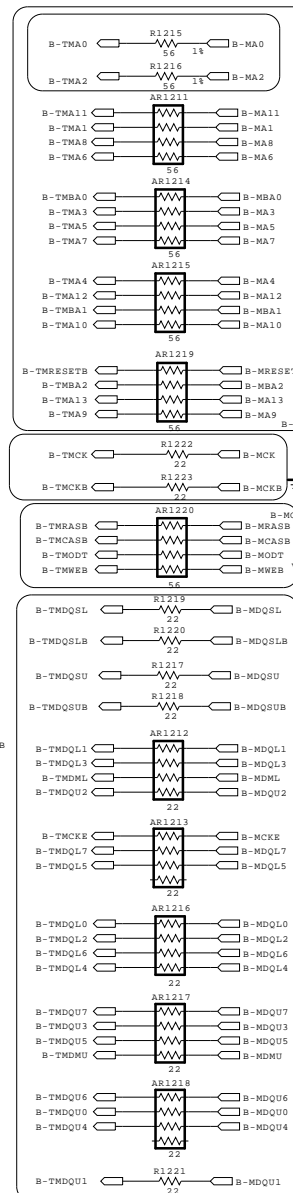
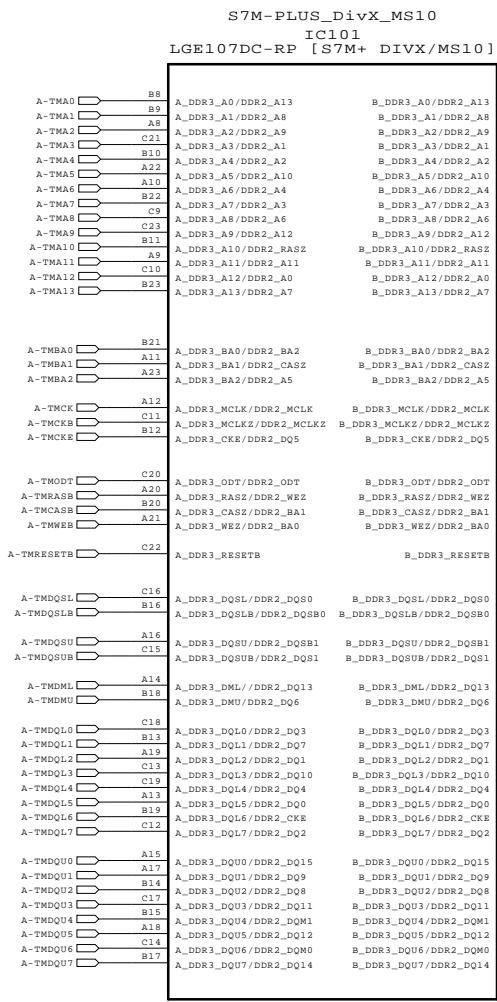
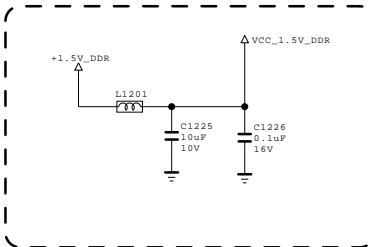




SECRET
LGElectronics



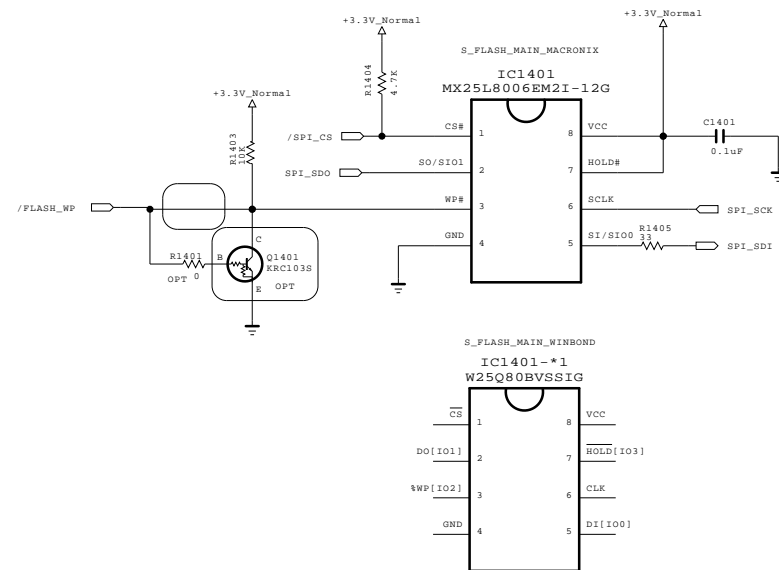
MODEL	GP2R	DATE	20101023
BLOCK	LVDS_LARGE	SHEET	11 /





SECRET
LGElectronics



MODEL	GP2R	DATE	20101023
BLOCK	DDR_256	SHEET	12 /



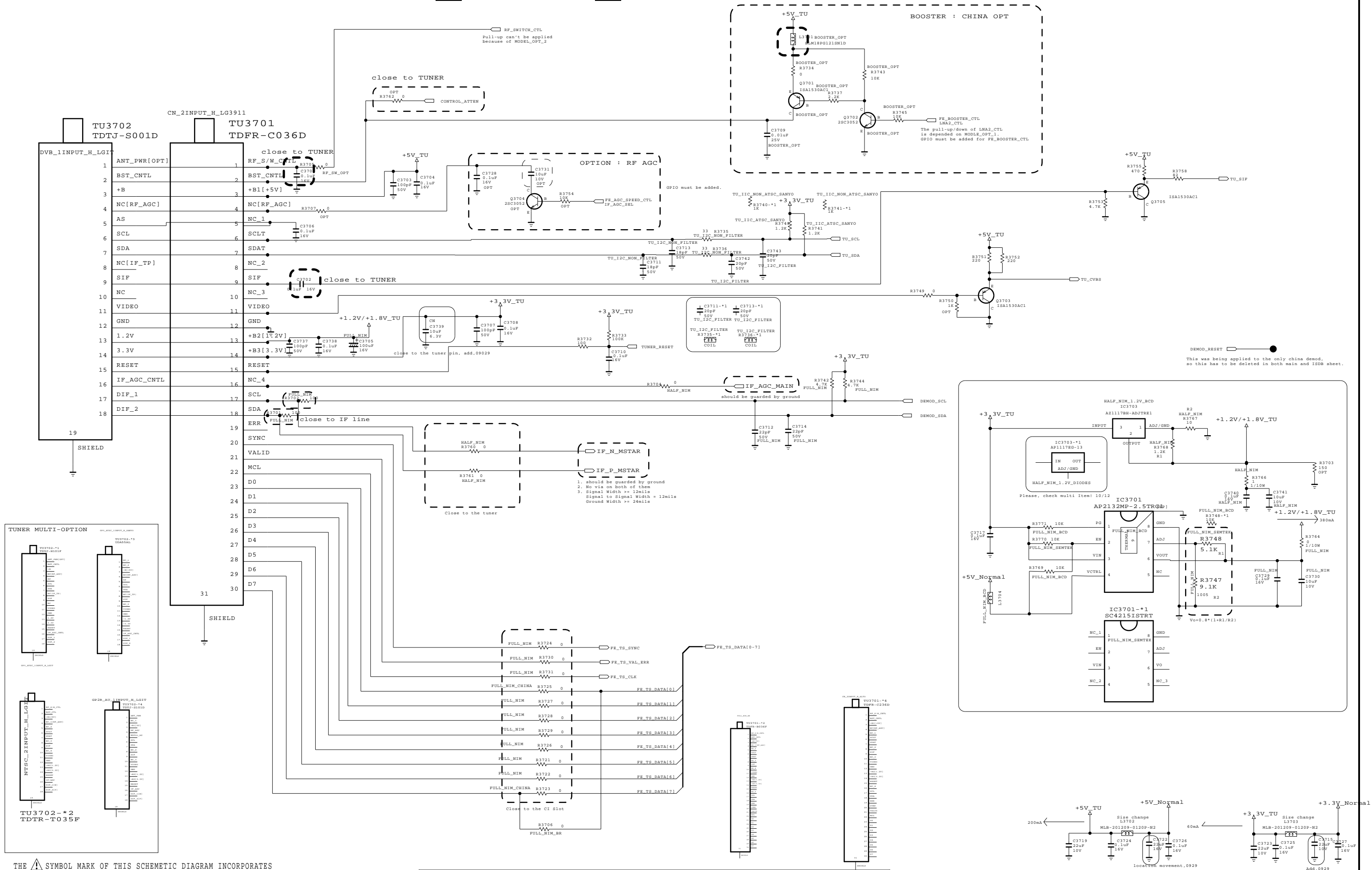
THE  SYMBOL MARK OF THIS SCHEMATIC DIAGRAM INCORPORATES SPECIAL FEATURES IMPORTANT FOR PROTECTION FROM X-RADIATION. FILRE AND ELECTRICAL SHOCK HAZARDS, WHEN SERVICING IF IS ESSENTIAL THAT ONLY MANUFACTURES SPECIFIED PARTS BE USED FOR THE CRITICAL COMPONENTS IN THE  SYMBOL MARK OF THE SCHEMATIC.



SECRET
LGElectronics



MODEL	GP2R	DATE	20101023
BLOCK	SFLASH 1MB	SHEET	13 /

GP2R_LARGE_TUNER



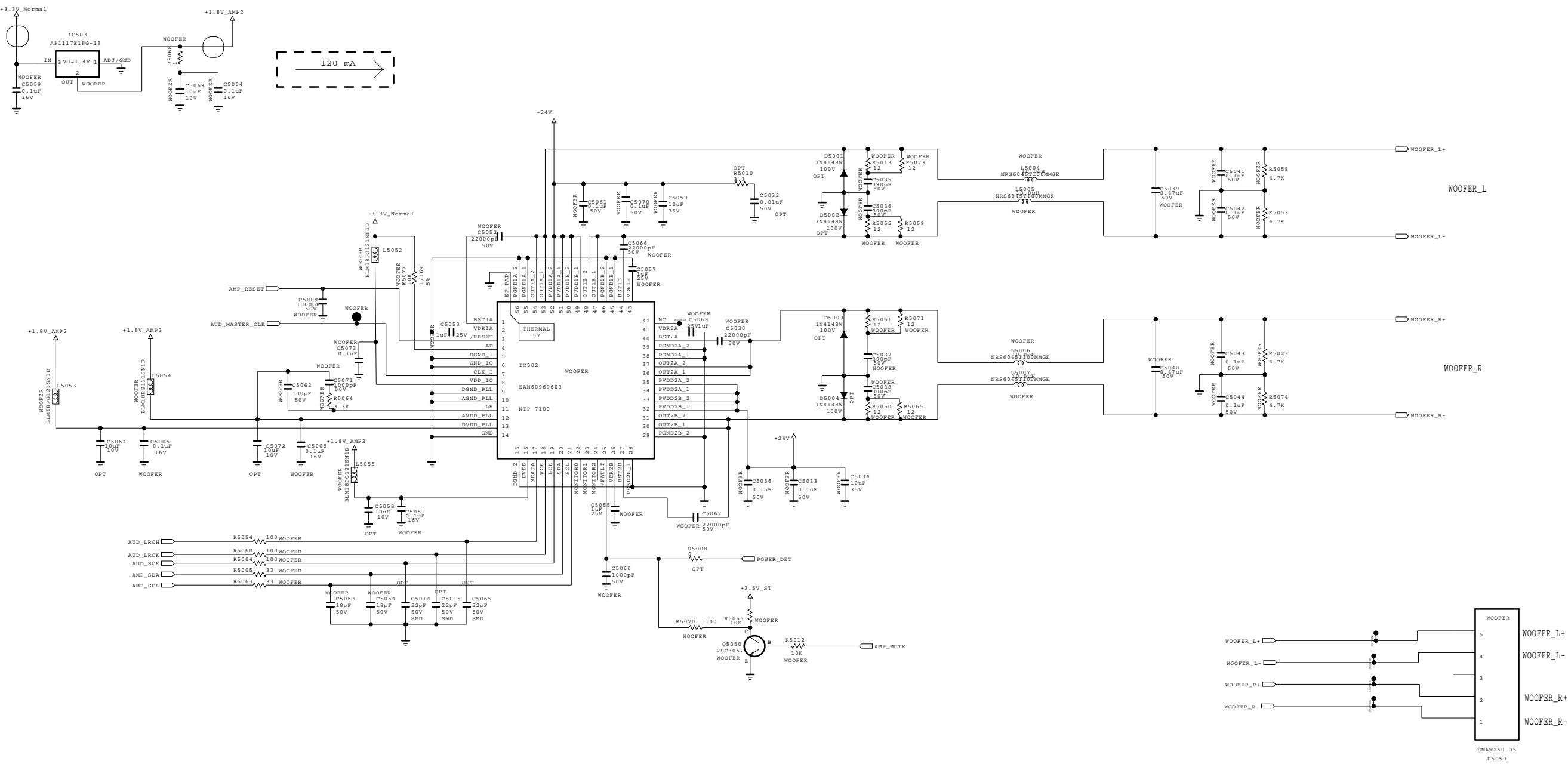
THE  SYMBOL MARK OF THIS SCHEMATIC DIAGRAM INCORPORATES SPECIAL FEATURES IMPORTANT FOR PROTECTION FROM X-RADIATION. FILRE AND ELECTRICAL SHOCK HAZARDS, WHEN SERVICING IF IS ESSENTIAL THAT ONLY MANUFACTURES SPECIFIED PARTS BE USED FOR THE CRITICAL COMPONENTS IN THE  SYMBOL MARK OF THE SCHEMATIC.

SECRET
LGElectronics



MODEL	GP2R	DATE	20101023
BLOCK	TUNER_L	SHEET	14 /

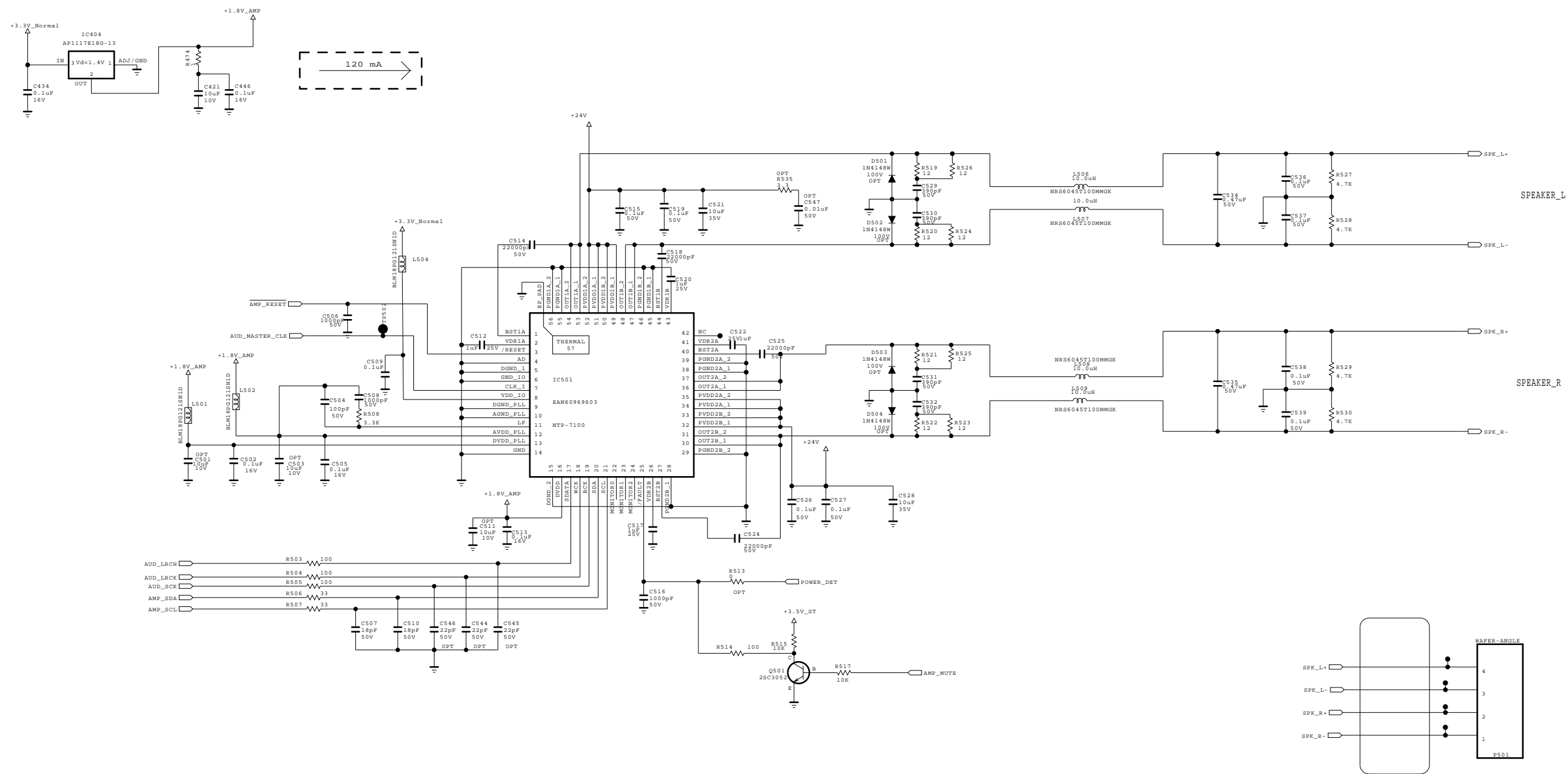
WOOFER AMP





SECRET
LGElectronics



MODEL	GP2R	DATE	20101023
BLOCK	WOOFER NTP	SHEET	15 /

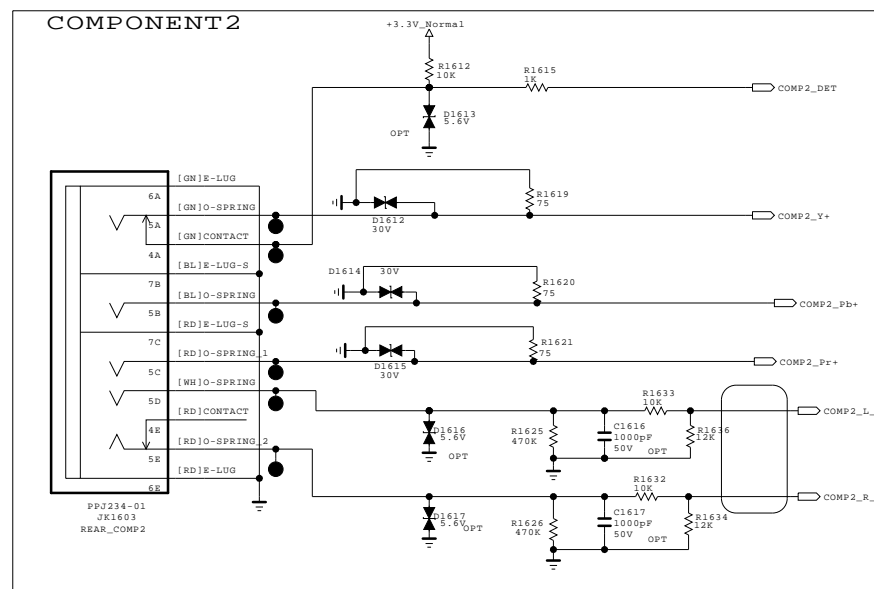


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SECRET
LGElectronics

 LG ELECTRONICS

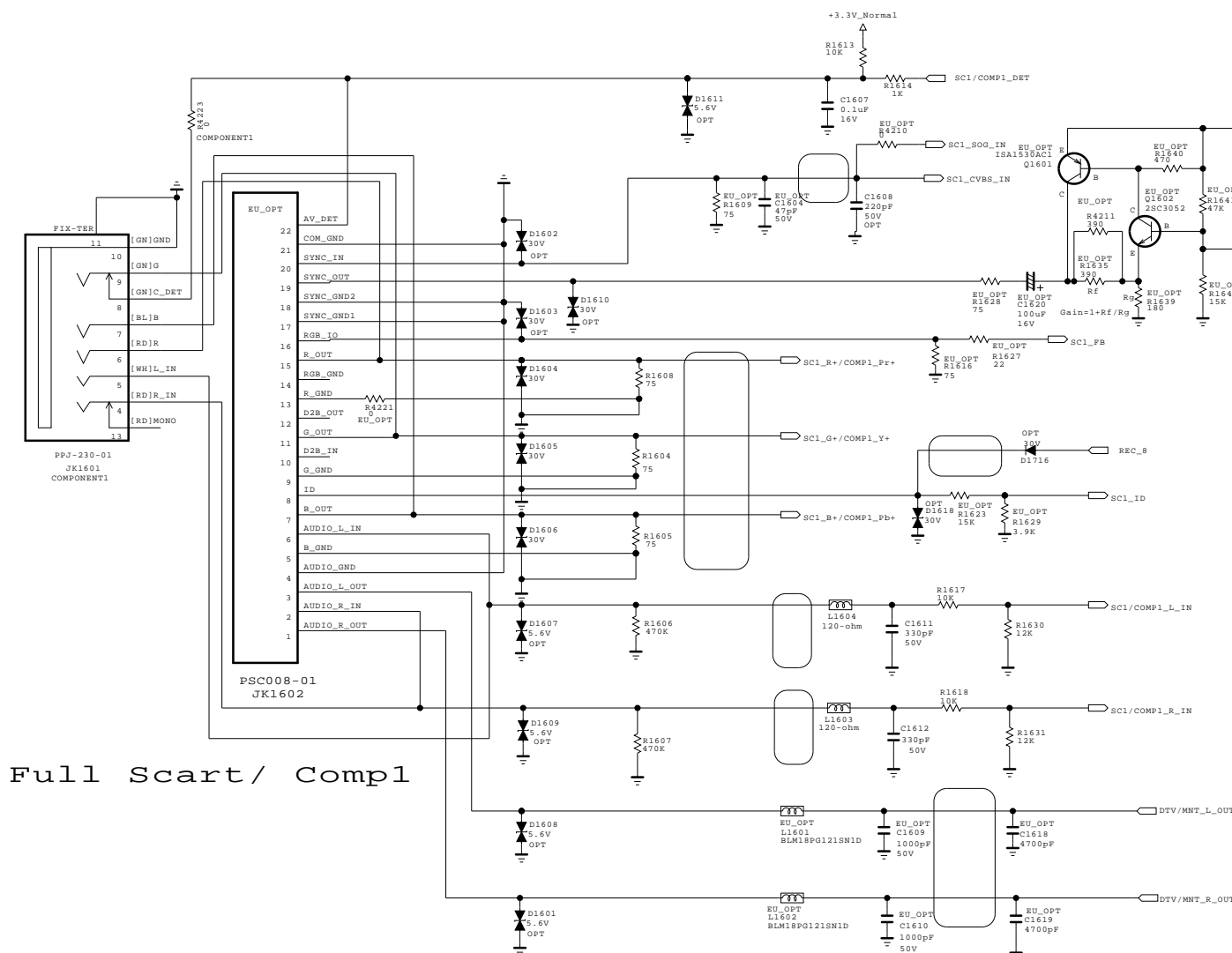
MODEL	GP2R	DATE	20101023
BLOCK	AMP NTP	SHEET	16 /



The diagram illustrates the timing relationships for various Ethernet controller signals. The signals are listed on the right, and their corresponding timing points are marked on the left with a black circle and a label (TP1610 to TP1620). The signals are:

- ET_RXD0
- ET_TXD0
- ET_RXD1
- ET_TXD1
- ET_REP_CLK
- ET_TX_EN
- ET_MDC
- ET_MDIO
- ET_CRS
- ET_RXER
- /EST-PHY

The timing points (TP1610 to TP1620) are marked on the left side of the diagram, indicating the specific time points where the signals are sampled or measured.



[SCART AUDIO MUTE]

DTV/MNT_L_OUT

EU_OPT Q1607 2SC3052

EU_OPT R1648 2K

DTV/MNT_R_OUT

EU_OPT Q1608 2SC3052

EU_OPT R1650 2K

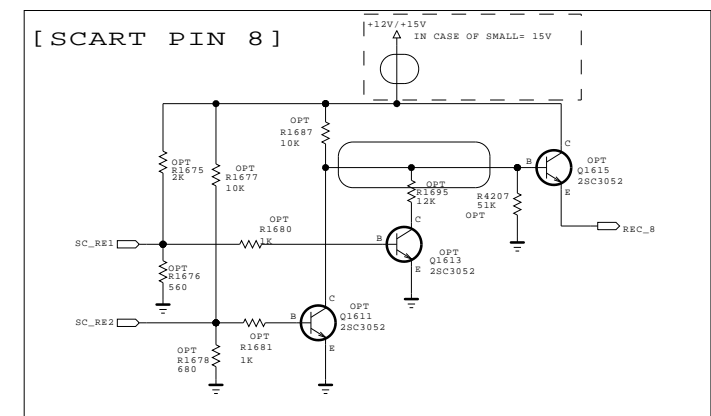
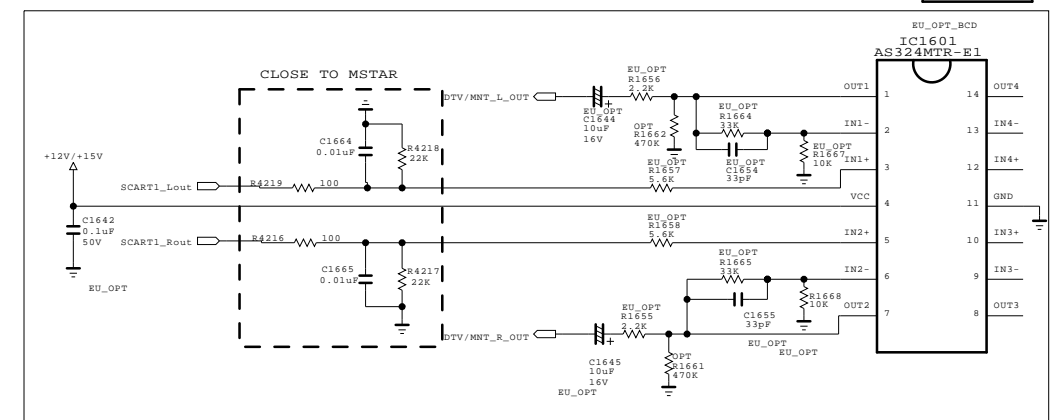
EU_OPT RT1P141C-T112 Q1610

EU_OPT R1652 10K

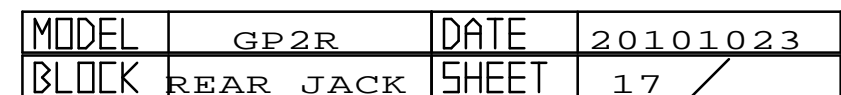
+3.5V_ST

SCART1_MUTE

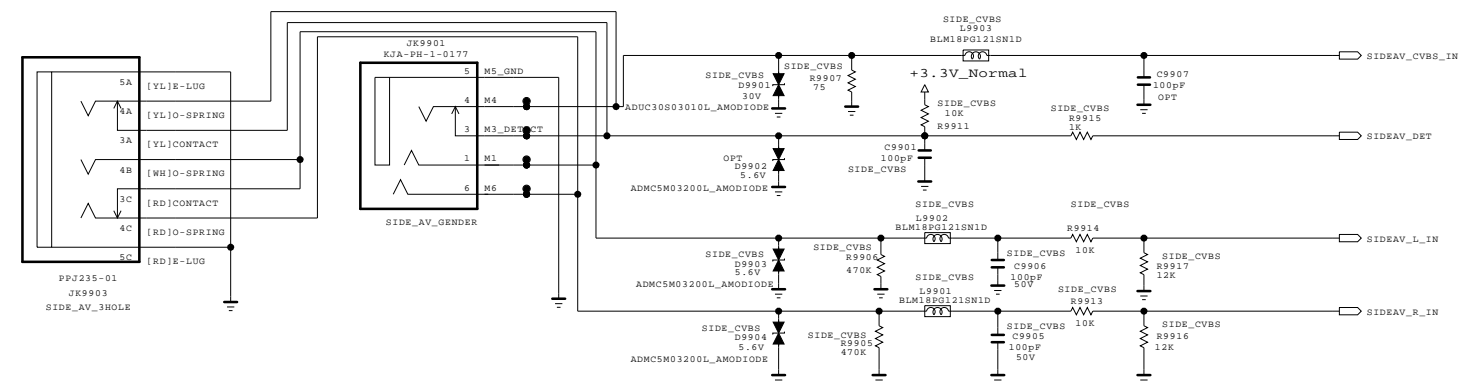
EU_OPT C1636 0.1uF



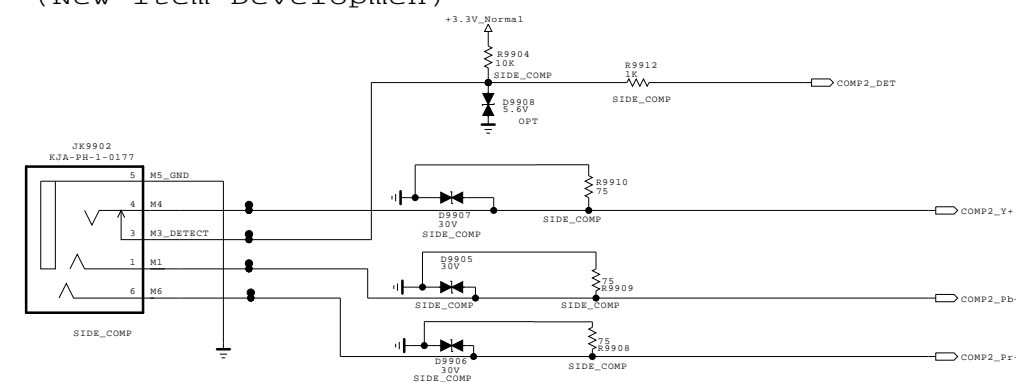
SECRET
LGElectronics





SIDE CVBS PHONE JACK
(New Item Development)



SIDE COMPONENT PHONE JACK
(New Item Development)



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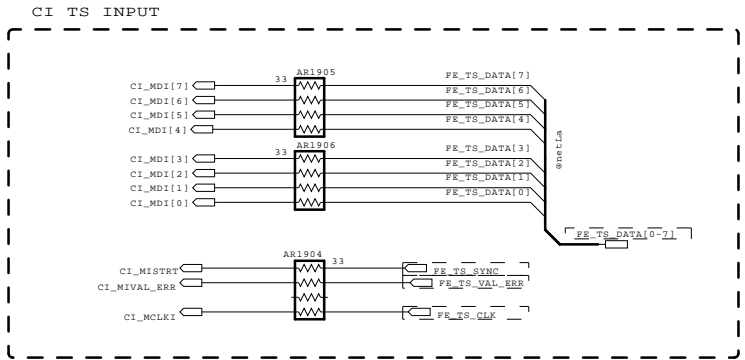
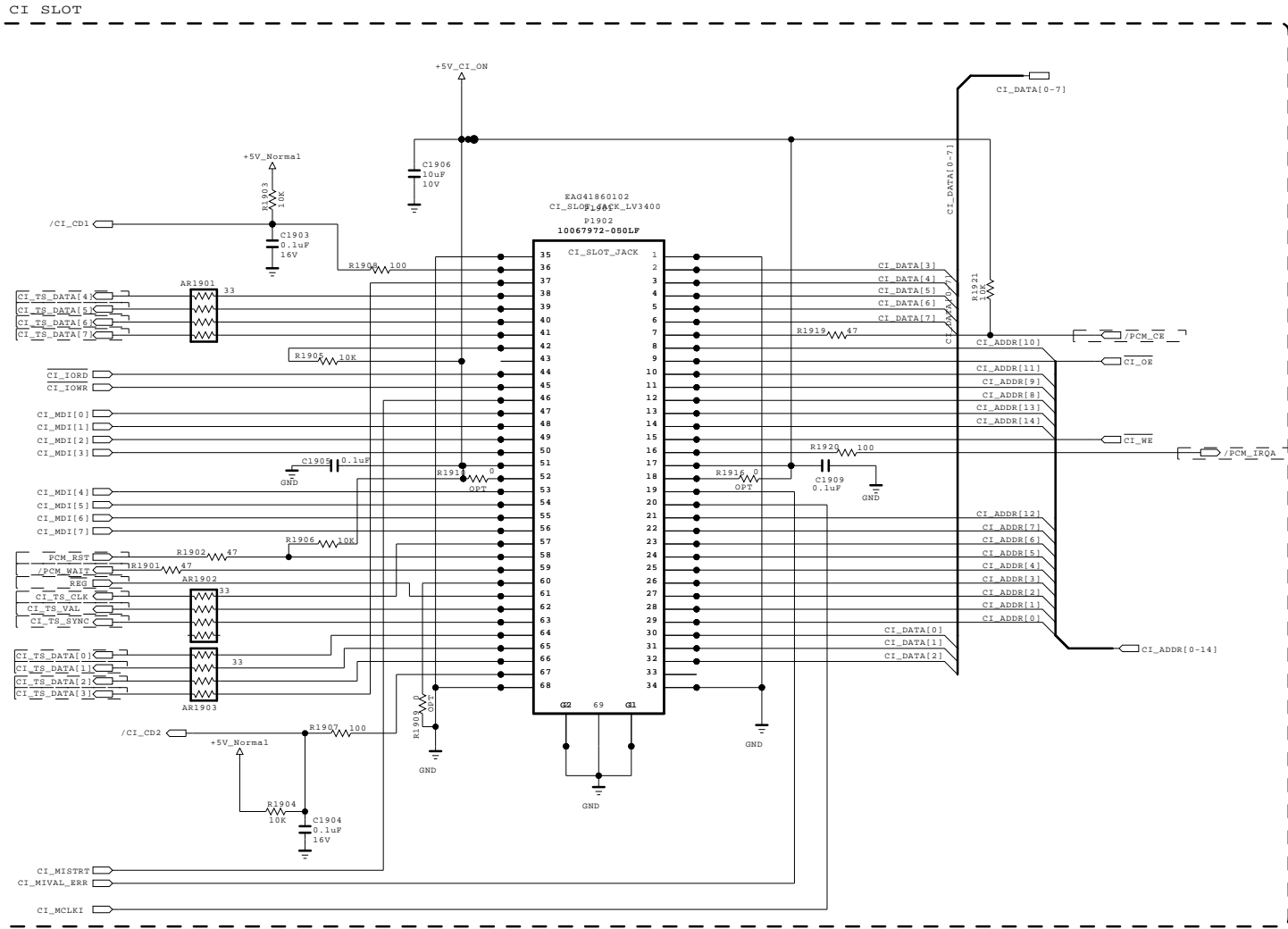
SECRET
LGElectronics



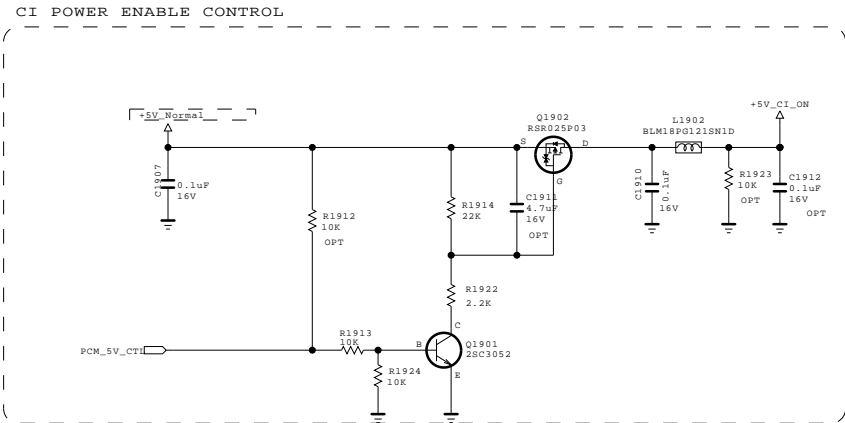
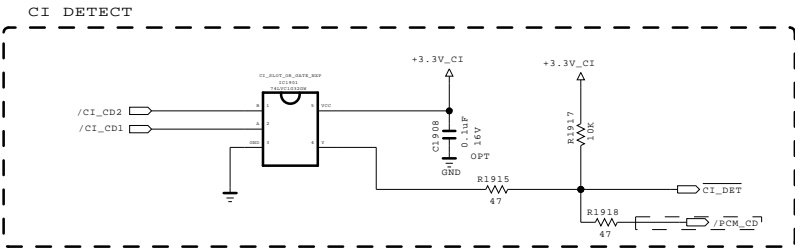
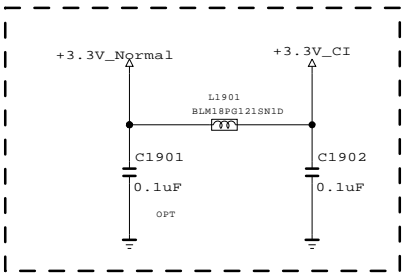
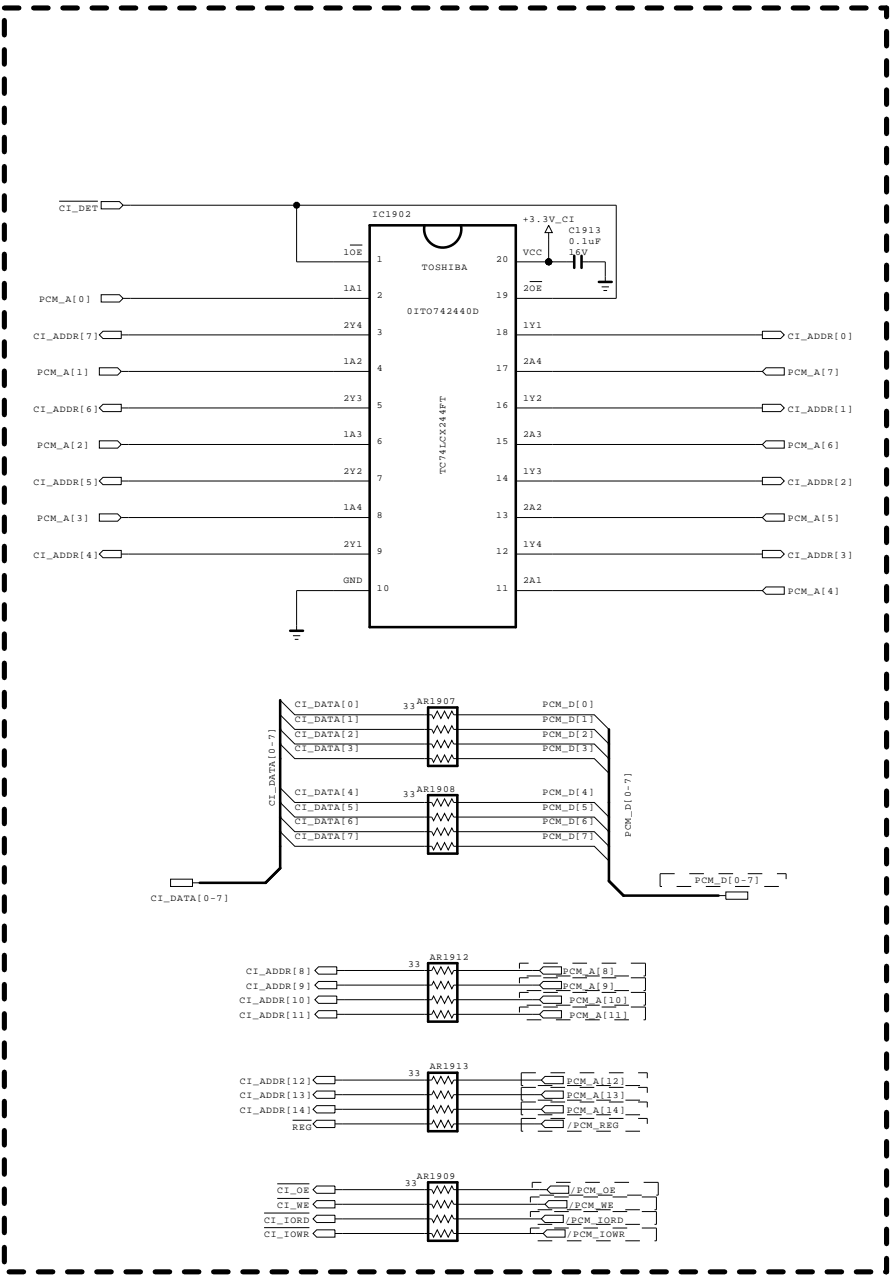
MODEL	GP2R	DATE	20101023
BLOCK	SIDE_JACK	SHEET	18 /



* Option name of this page : CI_SLOT
(because of Hong Kong)

CI Region



CI HOST I/F





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SECRET
LGElectronics

LG ELECTRONICS

MODEL	GP2R	DATE	20101023
BLOCK	PCMC I	SHEET	20 /

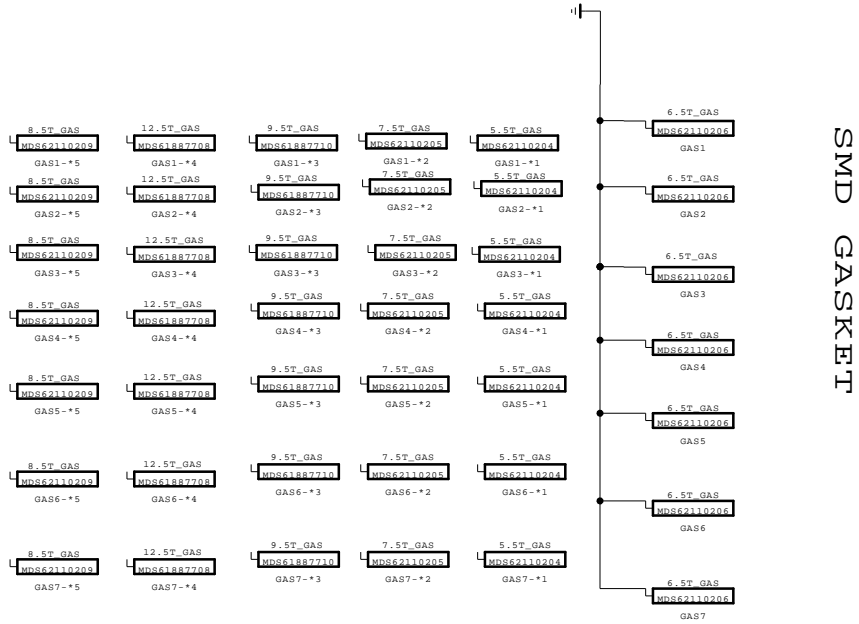
THE  SYMBOL MARK OF THIS SCHEMATIC DIAGRAM INCORPORATES SPECIAL FEATURES IMPORTANT FOR PROTECTION FROM X-RADIATION, FIRE AND ELECTRICAL SHOCK HAZARDS, WHEN SERVICING IF IS ESSENTIAL THAT ONLY MANUFACTURES SPECIED PARTS BE USED FOR THE CRITICAL COMPONENTS IN THE  SYMBOL MARK OF THE SCHEMATIC.

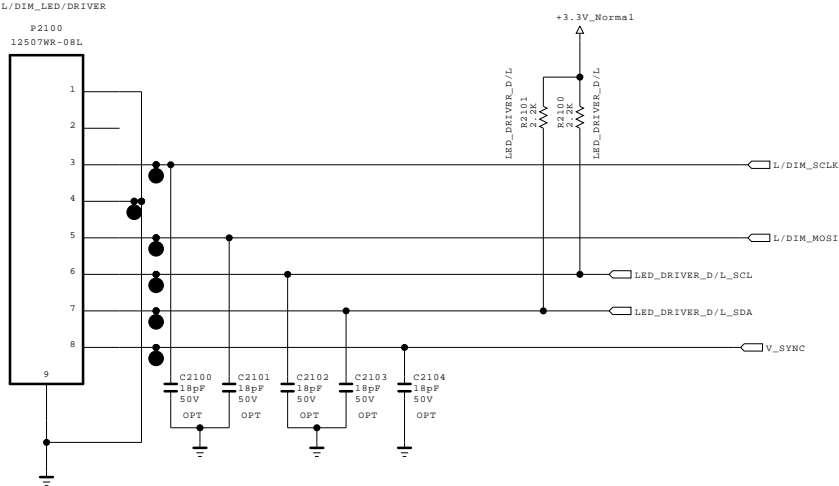
SECRET



LGElectronics



MODEL	GP2R	DATE	20101023
BLOCK	SMD_GAS	SHEET	20 /



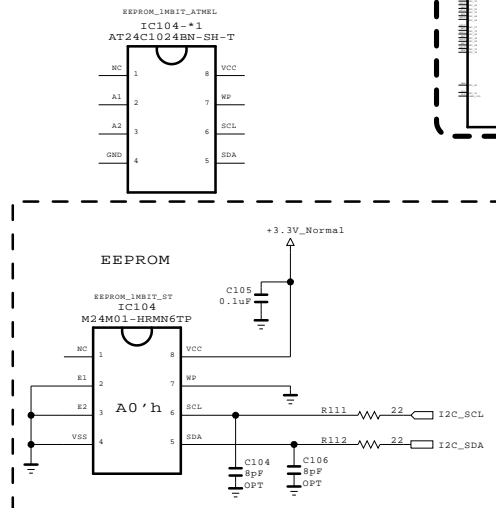
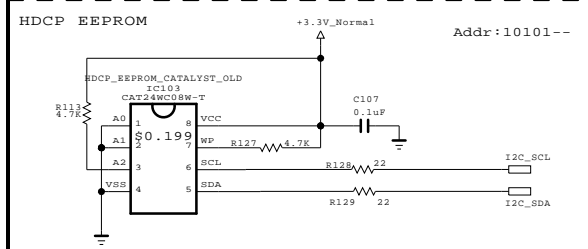
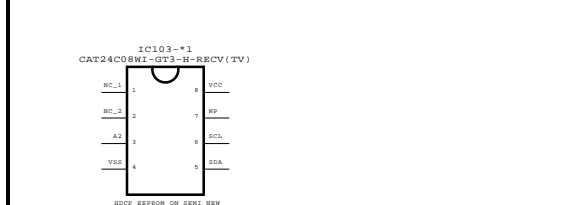
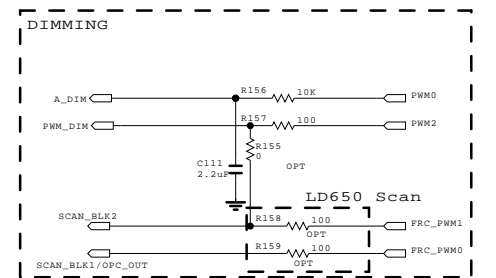
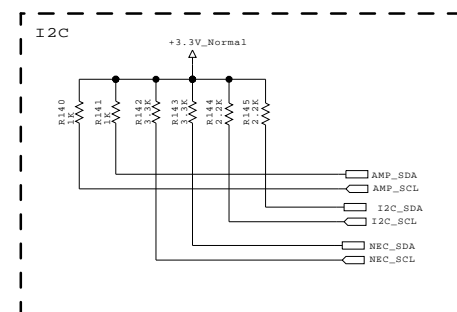
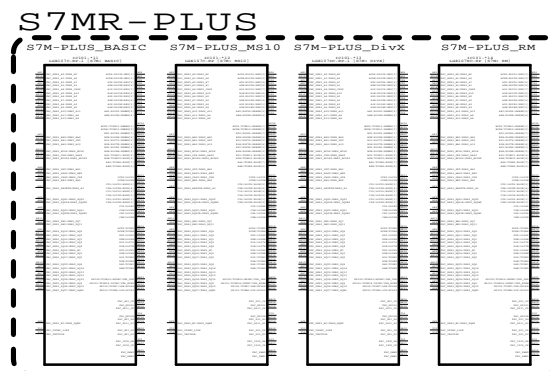
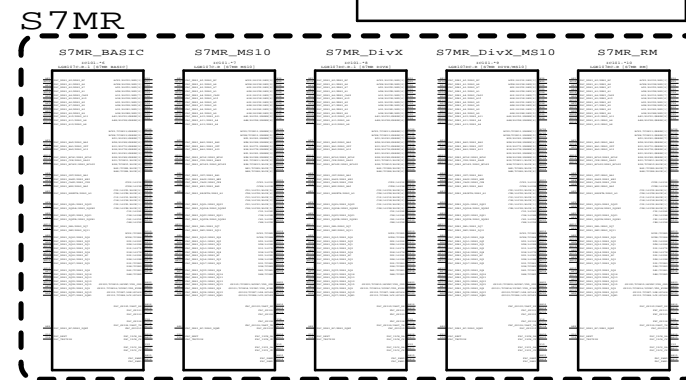
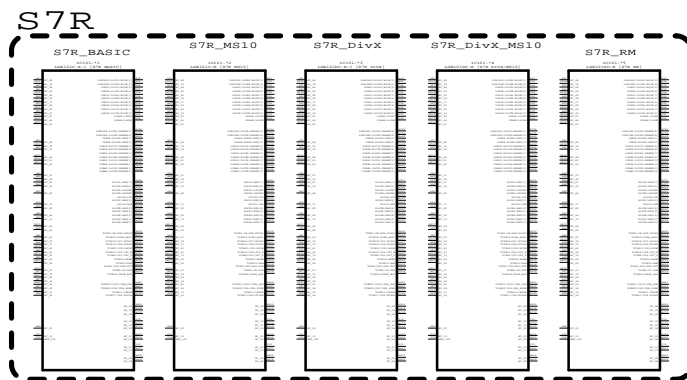
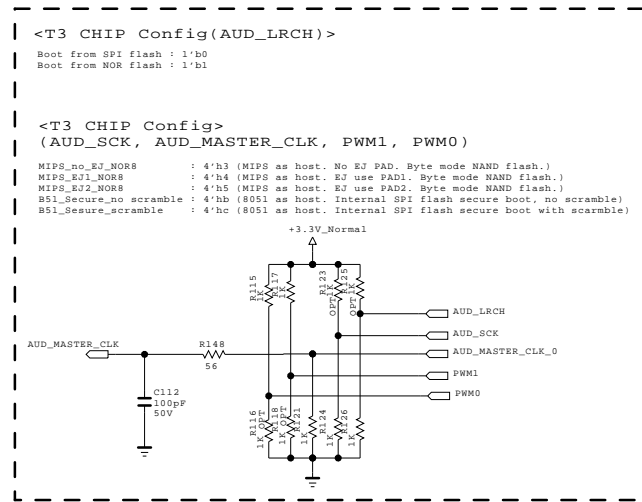


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SECRET
LGElectronics



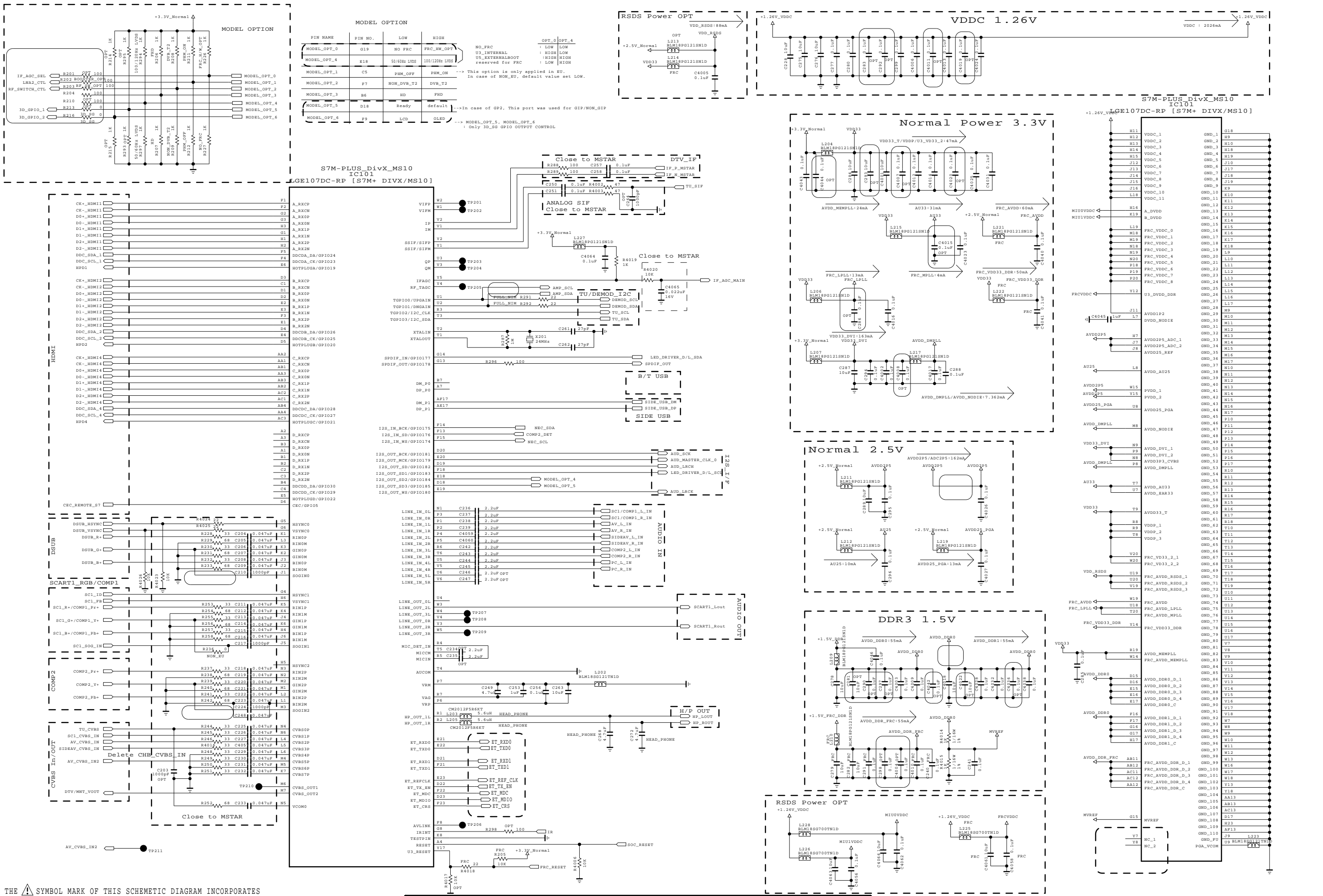
MODEL	GP2R	DATE	20101023
BLOCK	L/DIM_LED	SHEET	21 /



SECRET
LGElectronics



MODEL	GP3_Saturn7M	DATE	Ver. 0.1
BLOCK	FLASH/EEPROM/GPIO	SHEET	1 /



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SECRET
LGElectronics

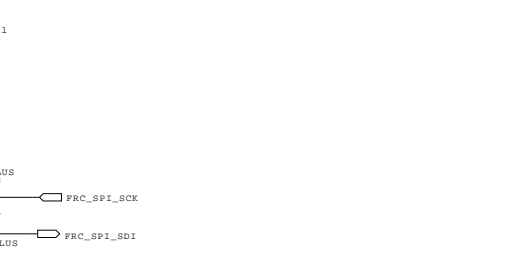
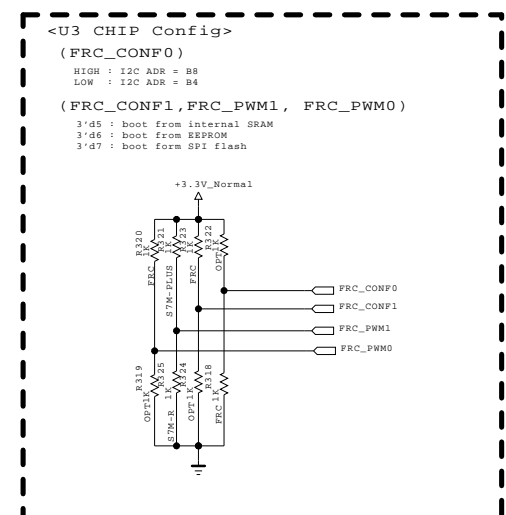
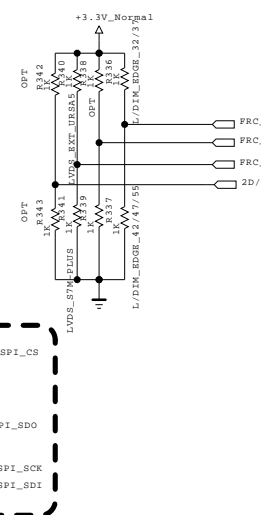
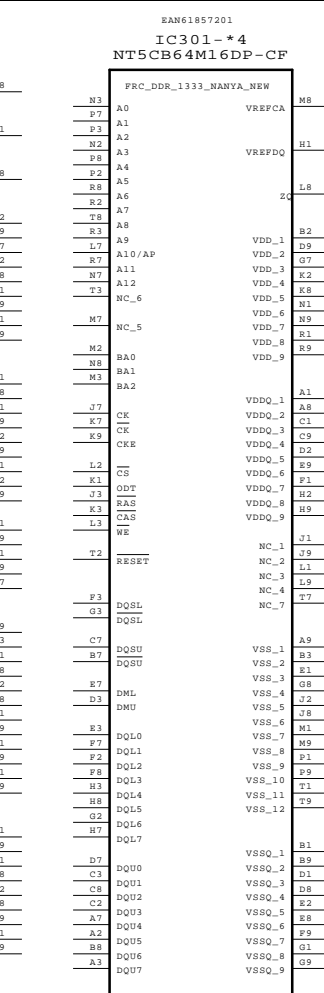
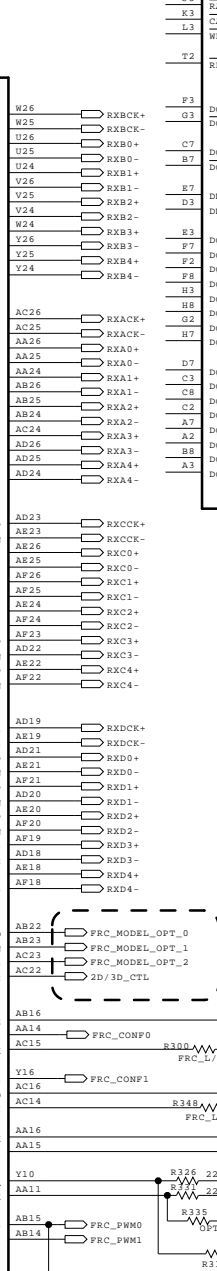
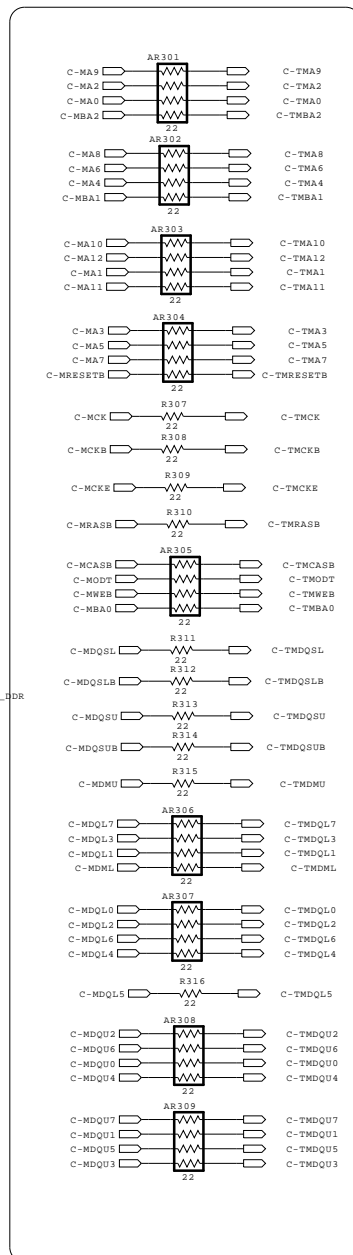
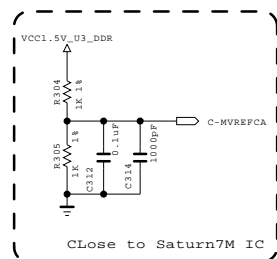
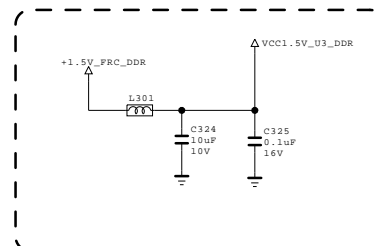


MODEL
BLOCK

GP2R
MAIN2, HW OPT

DATE
SHEET

20101023
2

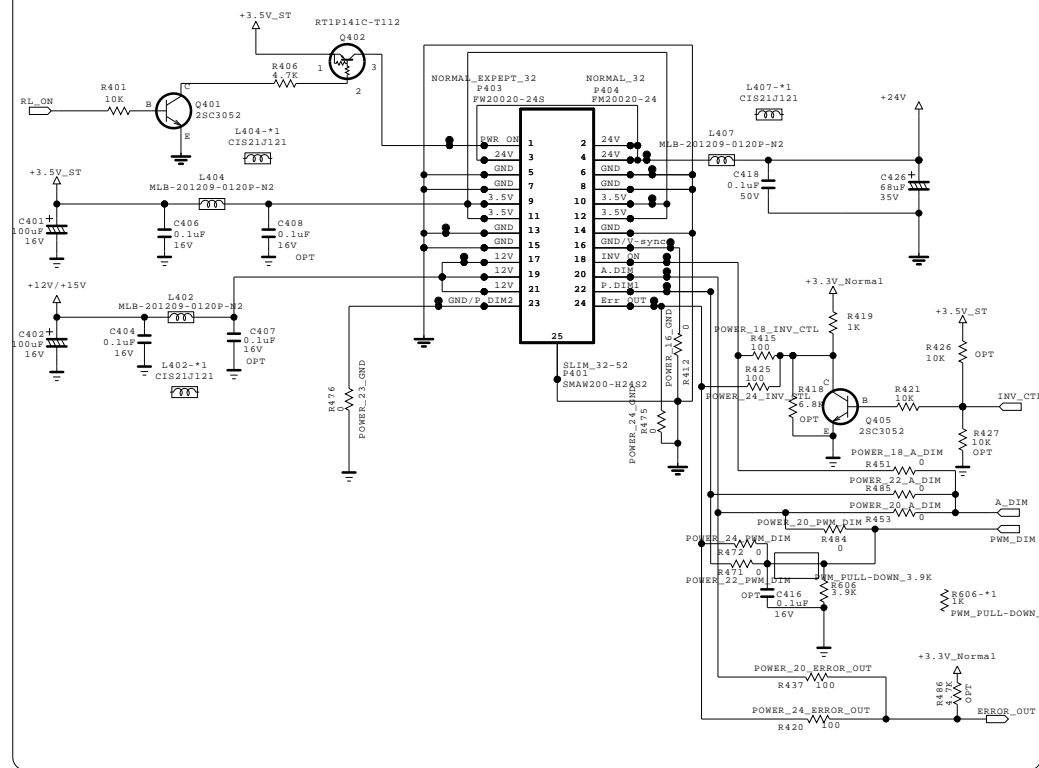


SECRET
LGElectronics



MODEL	GP2R	DATE	20101023
BLOCK	FRC_DDR	SHEET	3 /

FROM LIPS & POWER B/D



<MODULE PIN MAP>

PIN No	LGD (PSU) or LIPS	CM010*Lamp (PSU)	AU0 10*Lamp (PSU)	SHARP (PSU)	IPS-@ (PSU)
16	GND	GND	GND	GND	GND
18	INV_ON	A-DIM	INV_ON	INV_ON	INV_ON
20	VBR-A	NC	Err_out	52/60:ERROR 26/32HD:NC	Err_out
22	PWM_DIM	PWM_DIM	NC	26/32/52:PWM 60:NC	NC
24	Err_out	INV_ON	PWM_DIM	26/32/52:GND 60:PWM	PWM_DIM
23	GND	GND	GND	GND	GND

<LED MODULE PIN MAP -> latest update 20100618>

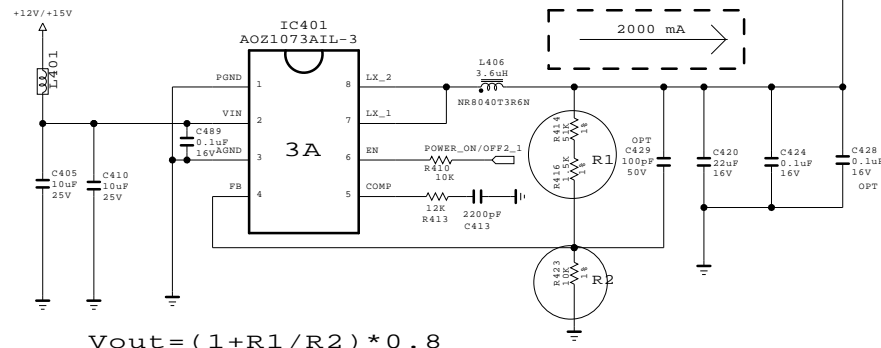
PIN No	LGD LPB/ OS LPB	32LR5300-TA CM010*LED (PSU)	32LR4500-TA AU0 10*LED (PSU)	32LR5300-TA LGD 10*LED (PSU)
16	NC	NC	NC	NC
18	INV_ON	INV_ON	INV_ON	INV_ON
20	NC	err_out err_out --> NC	--> NC	NC
22	PWM_DIM	NC	NC	PWM_DIM
24	err_out --> NC	PWM_DIM	PWM_DIM	err_out --> NC
23	NC	NC	NC	NC

LGD edge led error-out use or not? checking is necessary...

<Module Inv to Main Pin Connection>

INV	<-->	MAIN
#11	<-->	#24
#12	<-->	#18
#13	<-->	#20
#14	<-->	#22

+5V_USB



$$V_{out} = (1 + R1/R2) * 0.8$$

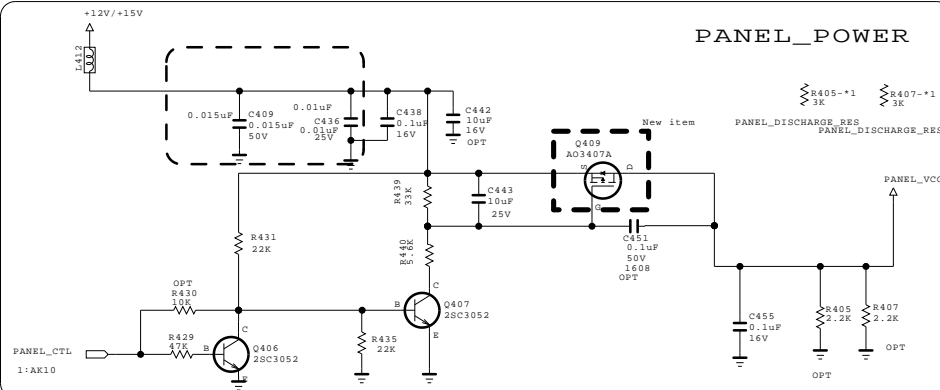
THE SYMBOL MARK OF THIS SCHEMATIC DIAGRAM INCORPORATES SPECIAL FEATURES IMPORTANT FOR PROTECTION FROM X-RADIATION. FILRE AND ELECTRICAL SHOCK HAZARDS, WHEN SERVICING IF IS ESSENTIAL THAT ONLY MANUFACTURES SPECIED PARTS BE USED FOR THE CRITICAL COMPONENTS IN THE SYMBOL MARK OF THE SCHEMATIC.

SECRET

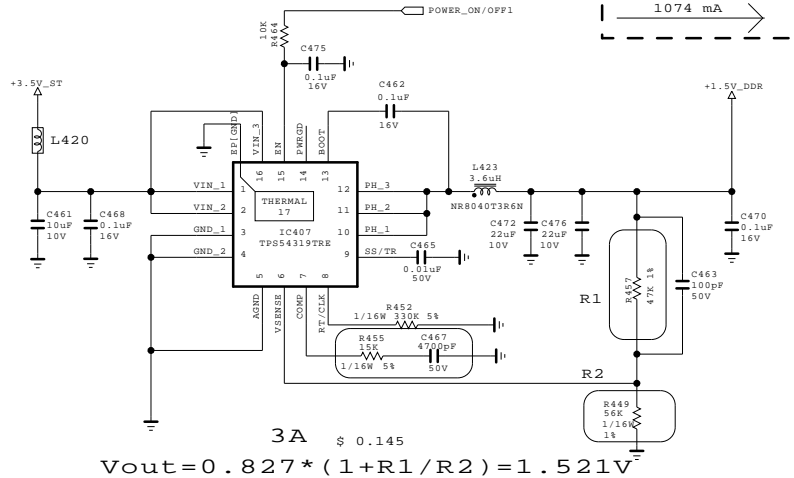
LGElectronics

LG ELECTRONICS

PANEL_POWER

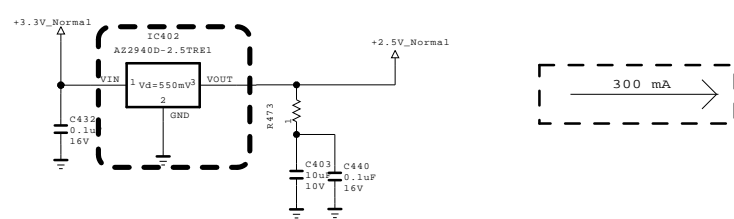


S7M DDR 1.5V

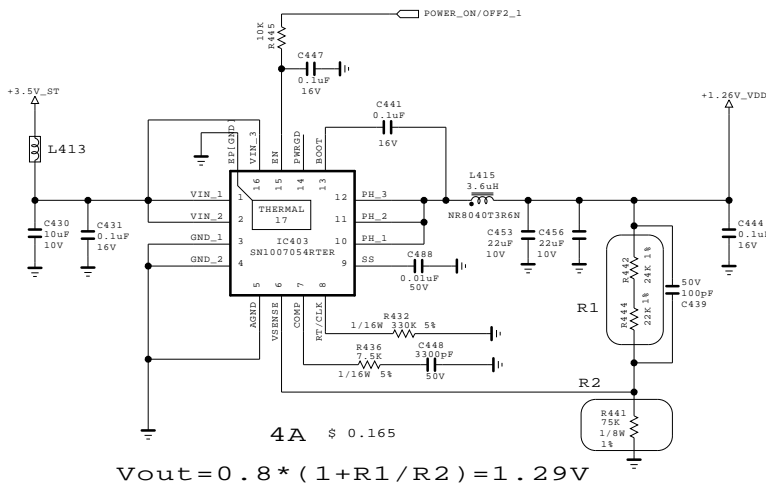


$$V_{out} = 0.827 * (1 + R1/R2) = 1.521V$$

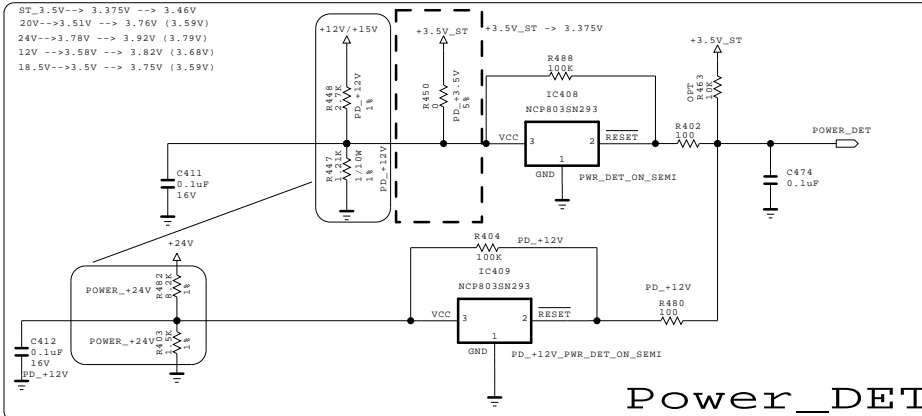
+2.5V/+1.8V



S7M core 1.26V volt

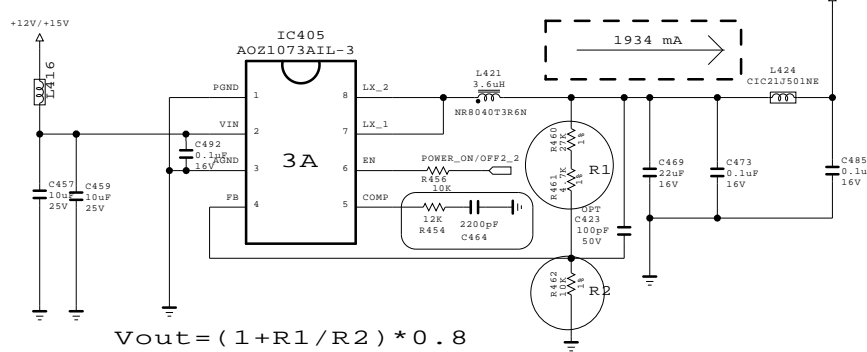


$$V_{out} = 0.8 * (1 + R1/R2) = 1.29V$$



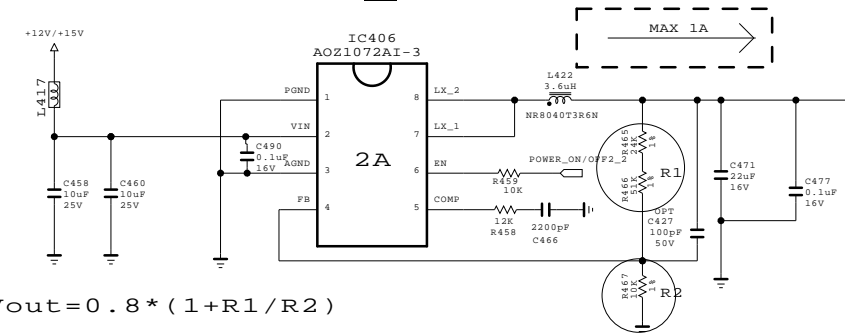
Power_DET

+3.3V_Normal

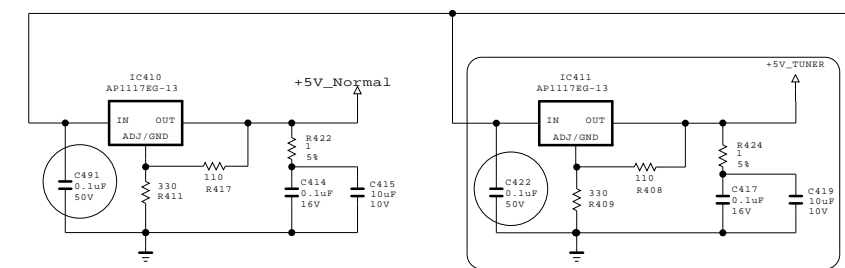


$$V_{out} = (1 + R1/R2) * 0.8$$

+5V_Normal

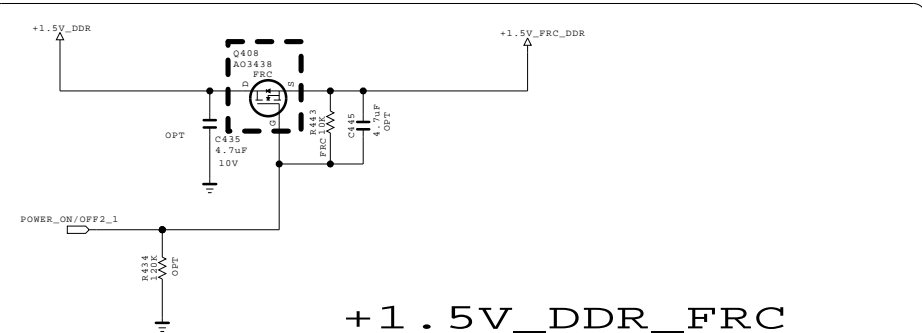


$$V_{out} = 0.8 * (1 + R1/R2)$$



C421,C422 Close to LDO

+1.5V_DDR_FRC

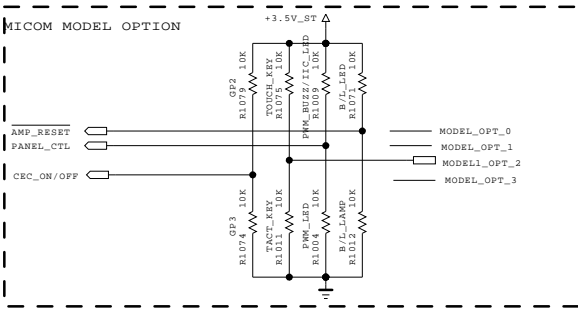


MODEL
BLOCK

GP2R
POWER_LARGE

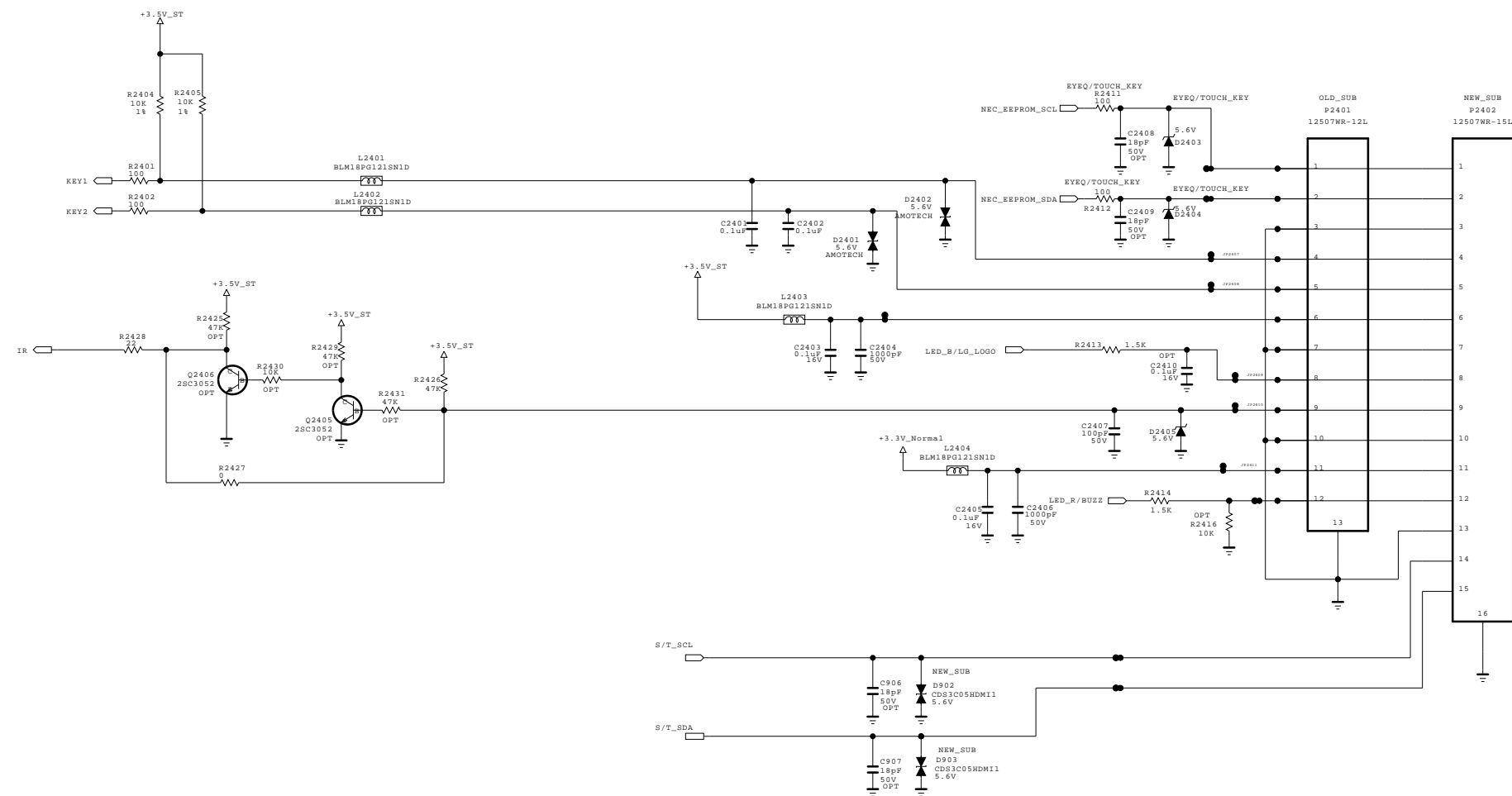
DATE
SHEET

20101023
4



MODEL	GP2R	DATE	20101125
BLOCK	MICOM Rev.4	SHEET	5 /

CONTROL
IR & LED

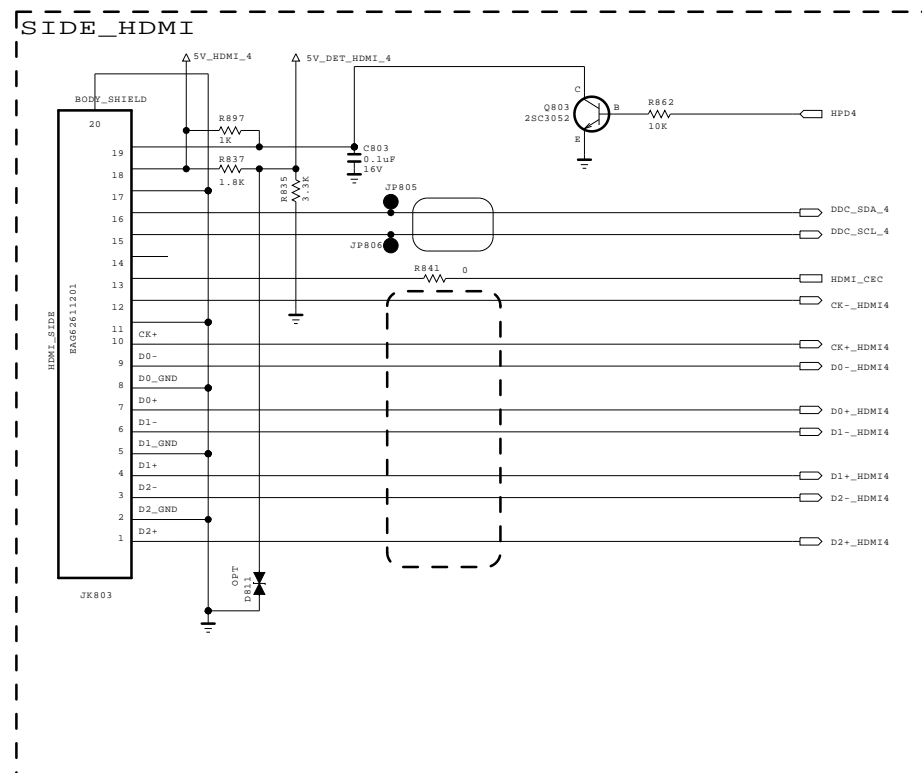
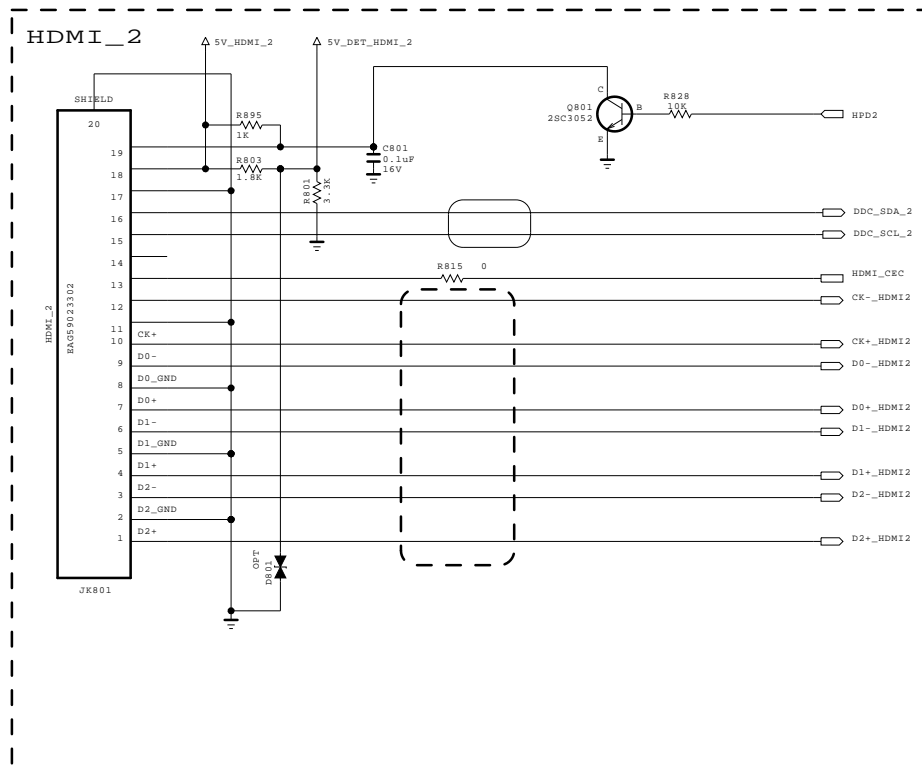
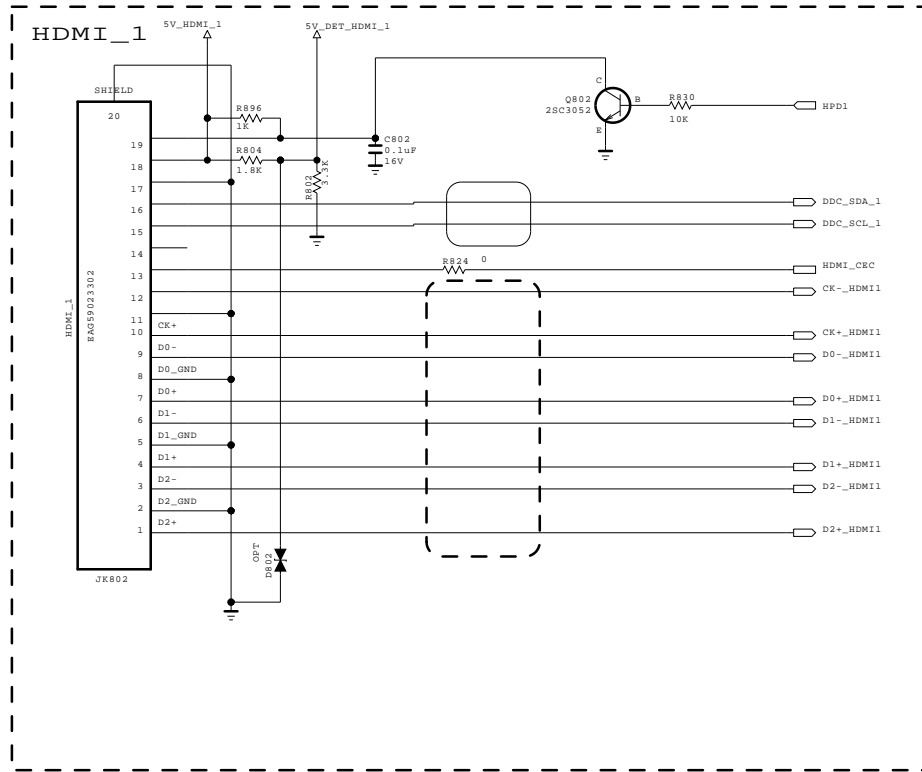


THE ⚠ SYMBOL MARK OF THIS SCHEMATIC DIAGRAM INCORPORATES SPECIAL FEATURES IMPORTANT FOR PROTECTION FROM X-RADIATION. FILRE AND ELECTRICAL SHOCK HAZARDS, WHEN SERVICING IF IS ESSENTIAL THAT ONLY MANUFACTURES SPECIFIED PARTS BE USED FOR THE CRITICAL COMPONENTS IN THE ⚠ SYMBOL MARK OF THE SCHEMATIC.

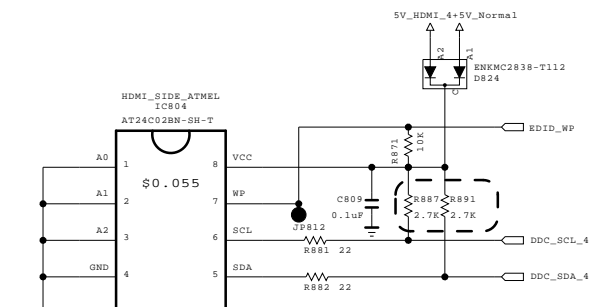
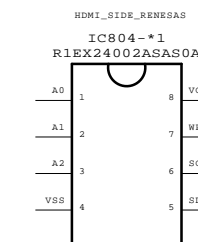
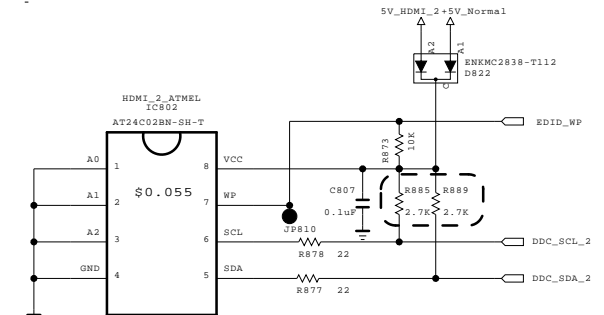
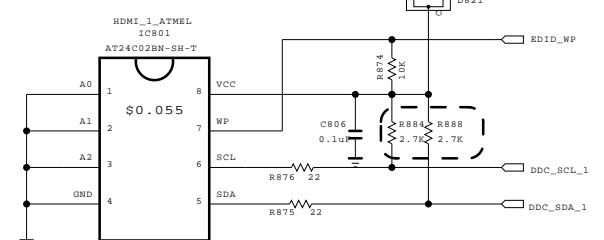
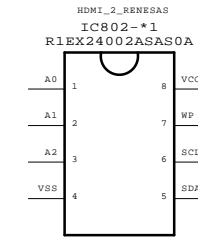
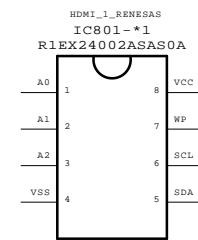
SECRET
LGElectronics



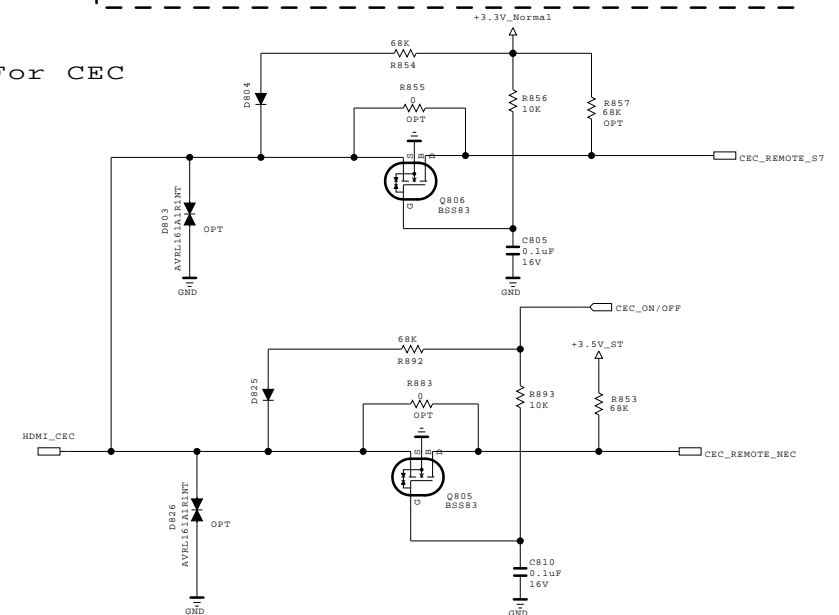
MODEL	GP2R	DATE	20101023
BLOCK	IR/CONTROL-L	SHEET	6 /





HDMI EEPROM



For CEC



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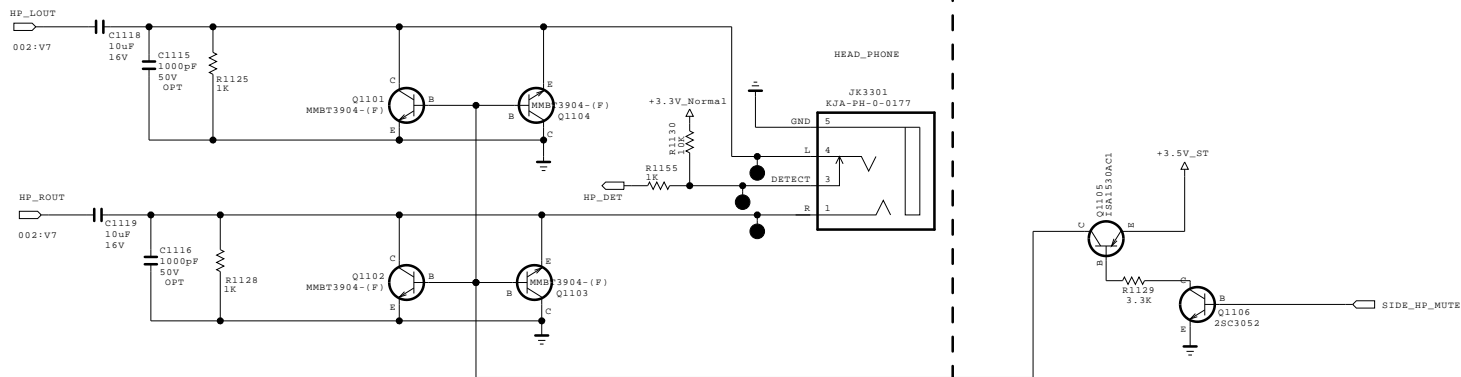
SECRET
LGElectronics

 LG ELECTRONICS

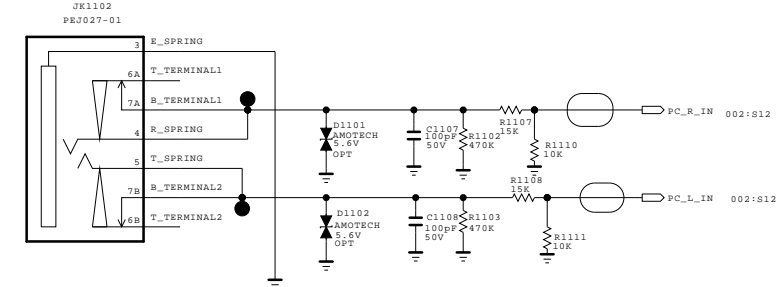
MODEL	GP2R	DATE	20101023
BLOCK	HDMI	SHEET	8

RGB / SPDIF / PC / HP

New Item Development EARPHONE BLOCK

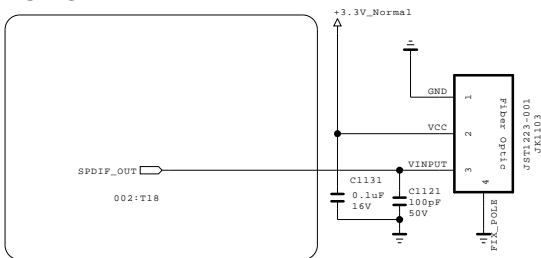


PC AUDIO

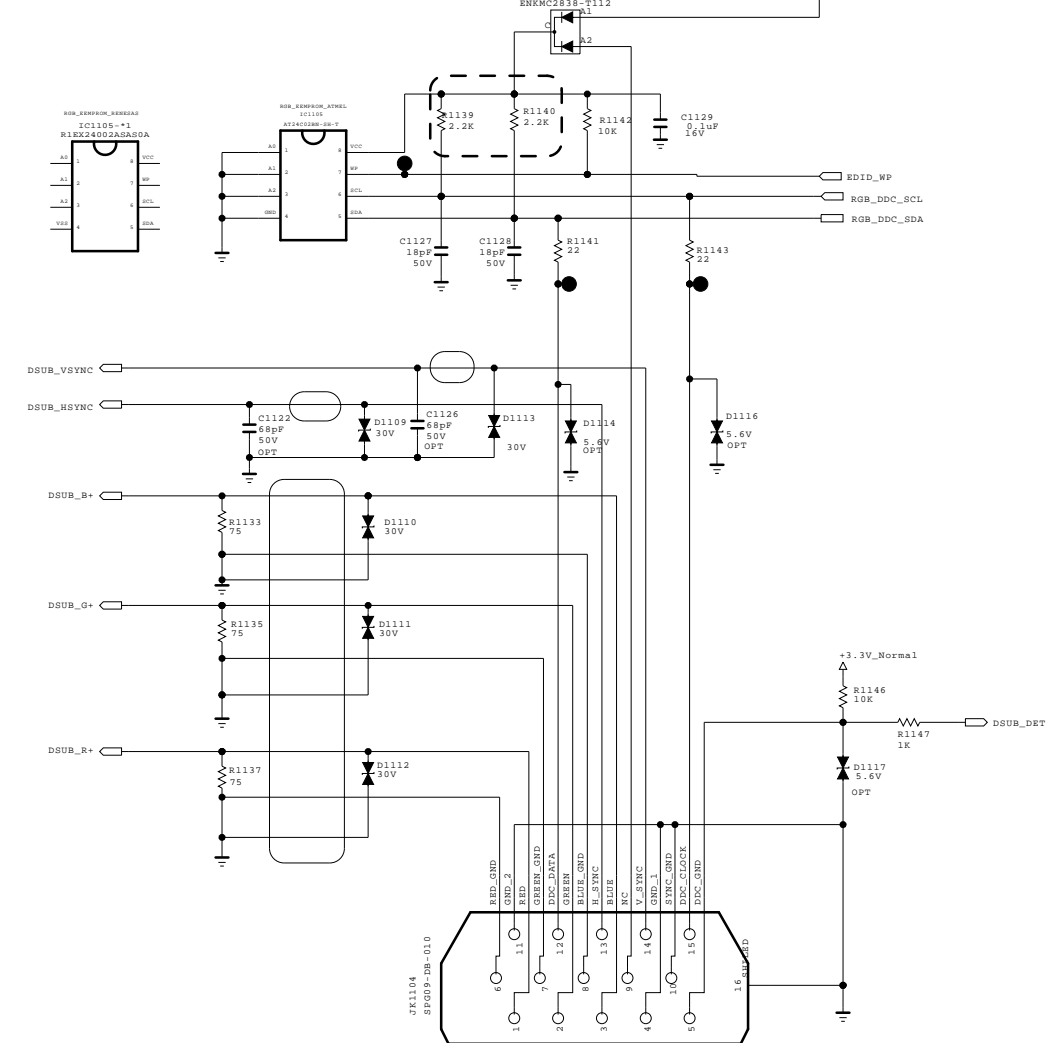




SPDIF OPTIC JACK

5.15 Meter Circuit Application



RGB PC



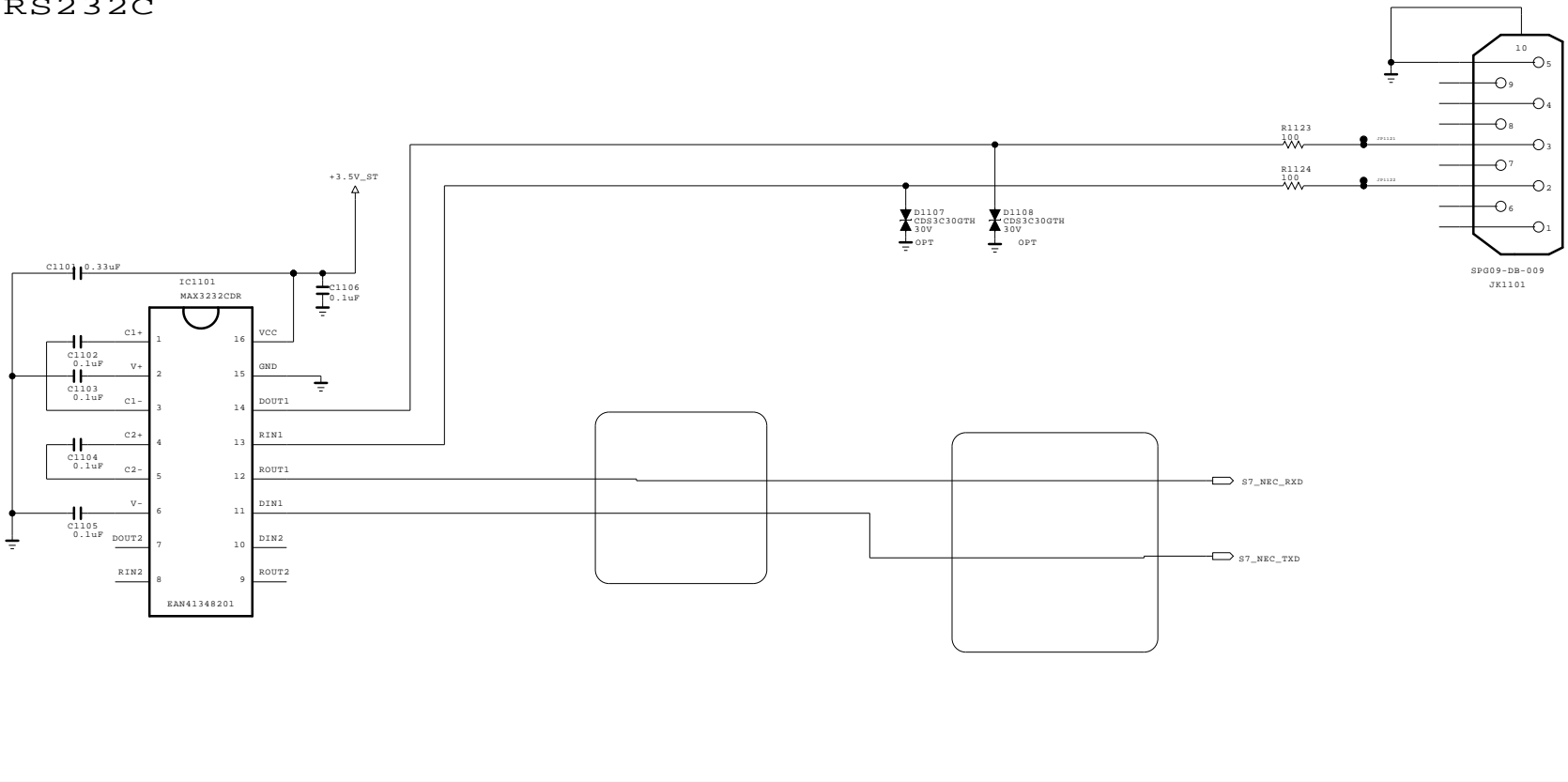
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MODEL	GP2R	DATE	20101023
BLOCK	RGB / SPDIF / HP	SHEET	9 /

RS232C

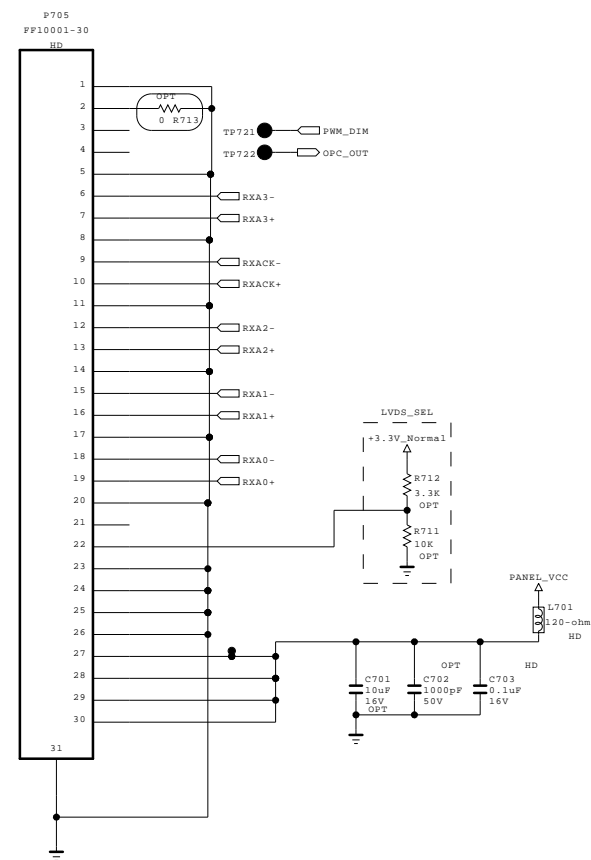
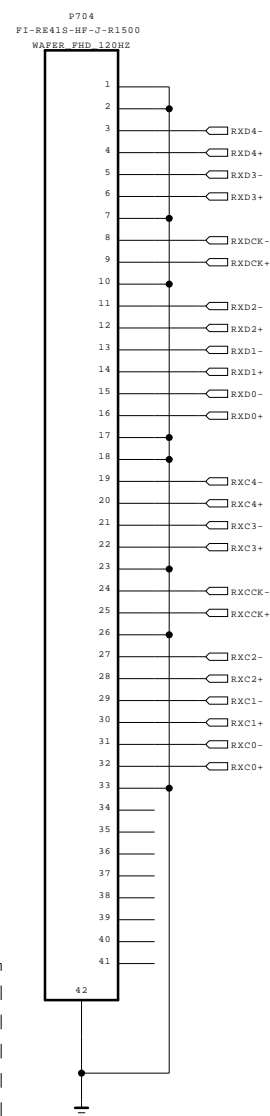
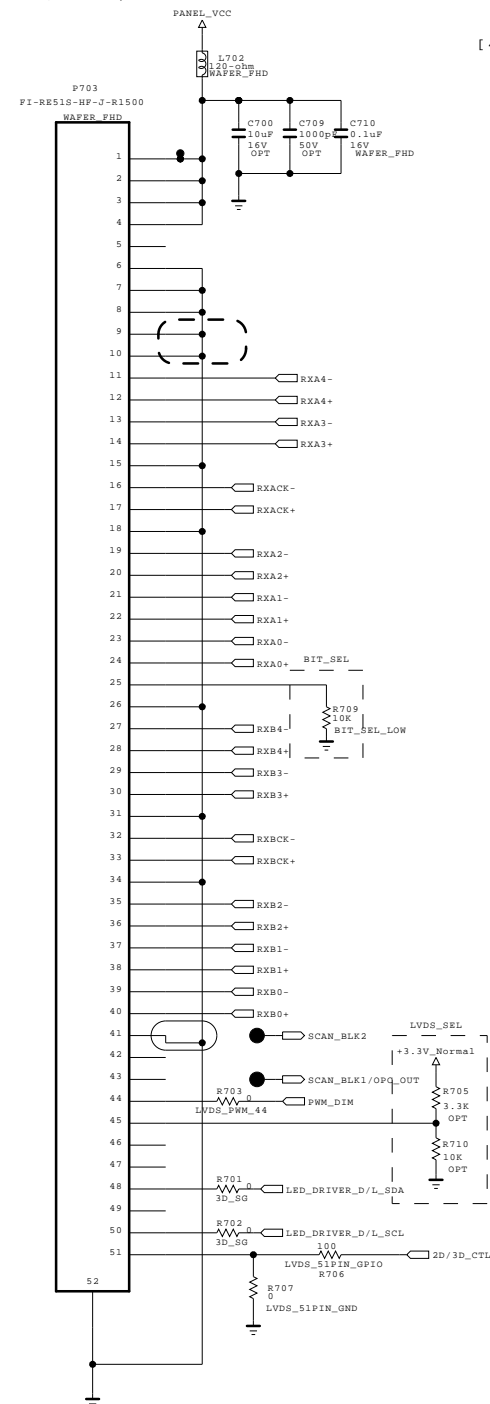


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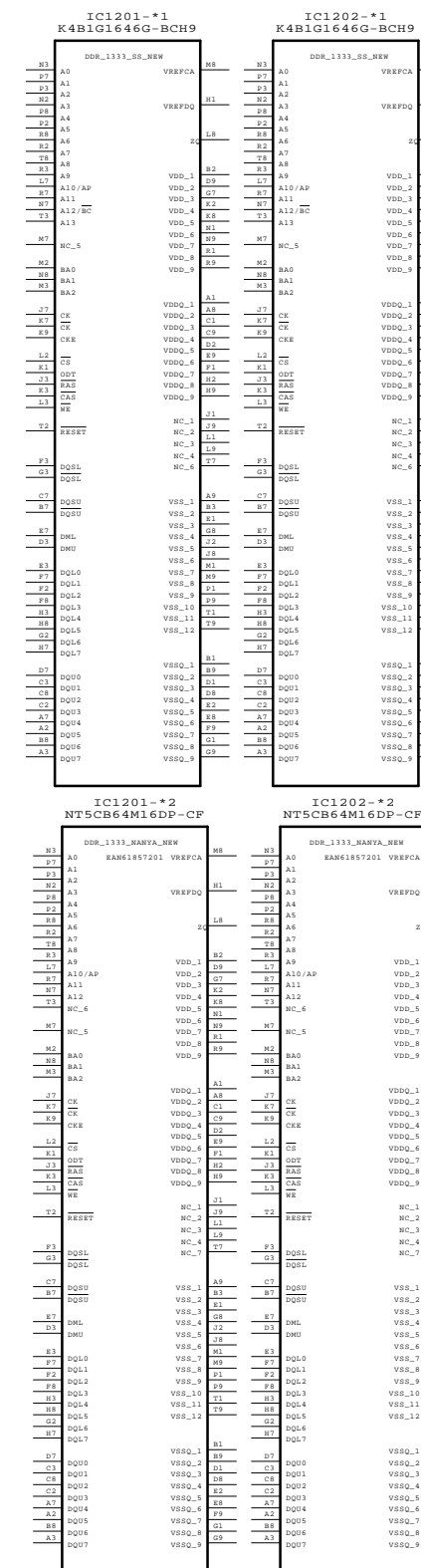
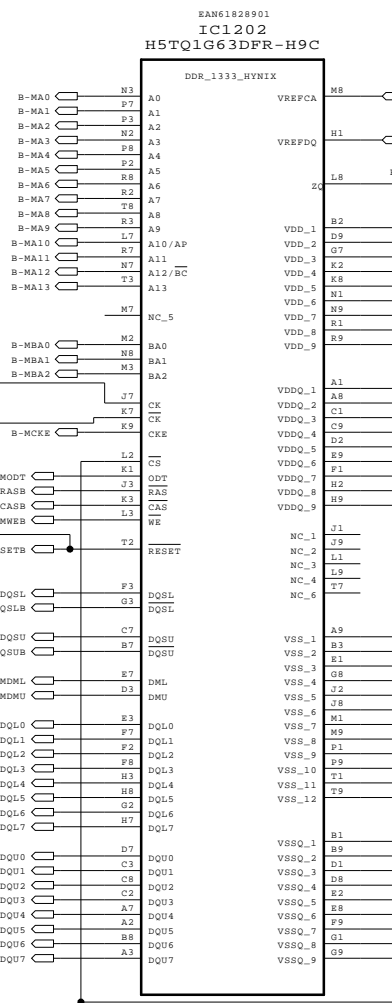
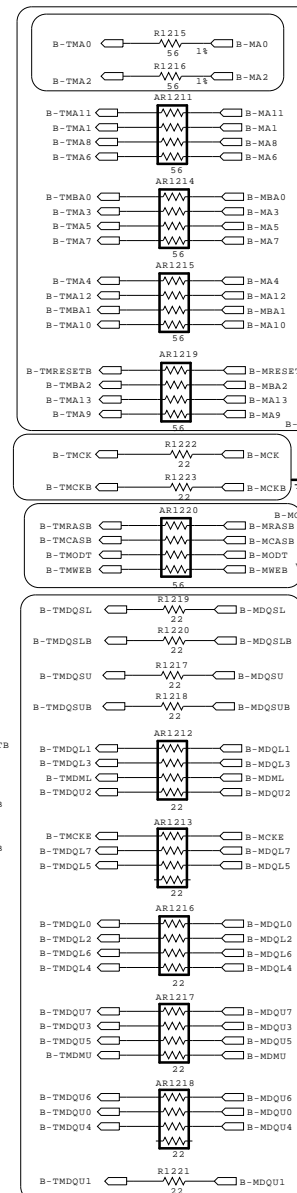
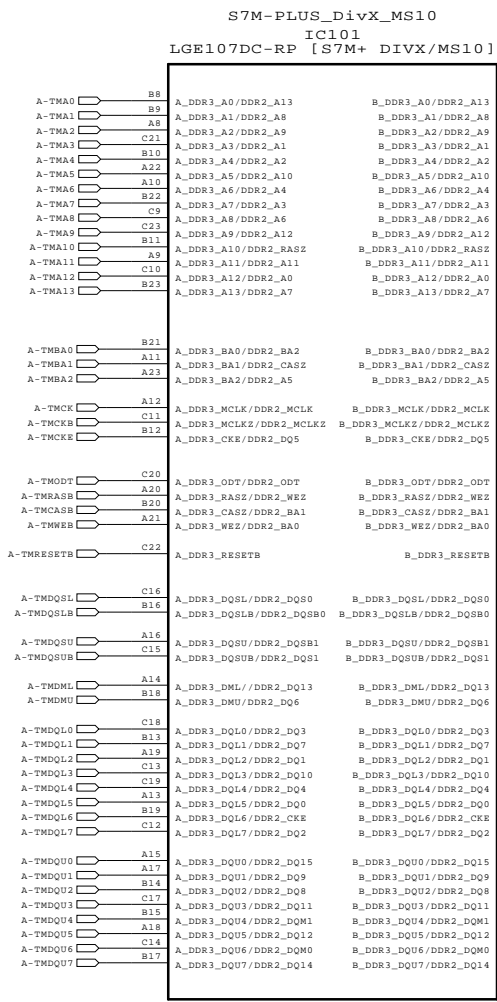
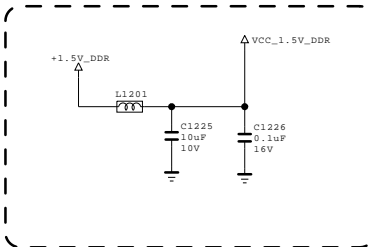
MODEL	GP2R	DATE	20101023
BLOCK	RS232C_9PIN	SHEET	10 /



SECRET
LGElectronics



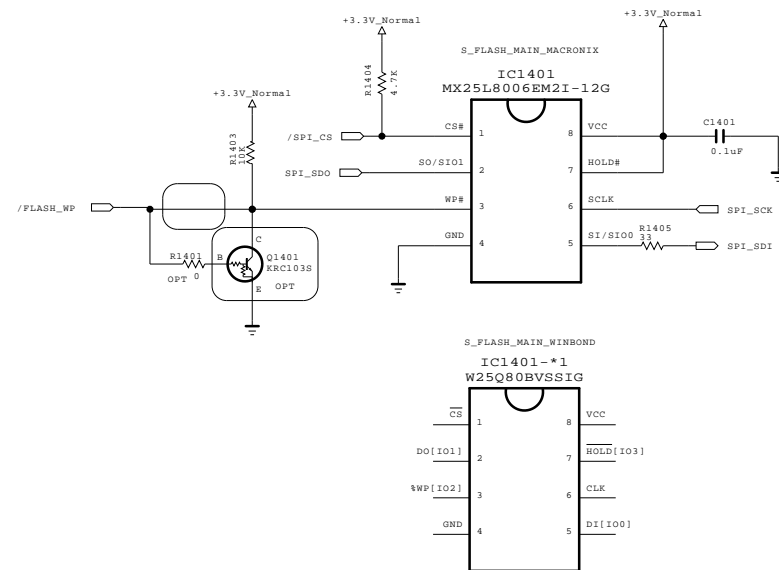
MODEL	GP2R	DATE	20101023
BLOCK	LVDS_LARGE	SHEET	11 /





SECRET
LG Electronics



MODEL	GP2R	DATE	20101023
BLOCK	DDR_256	SHEET	12 /



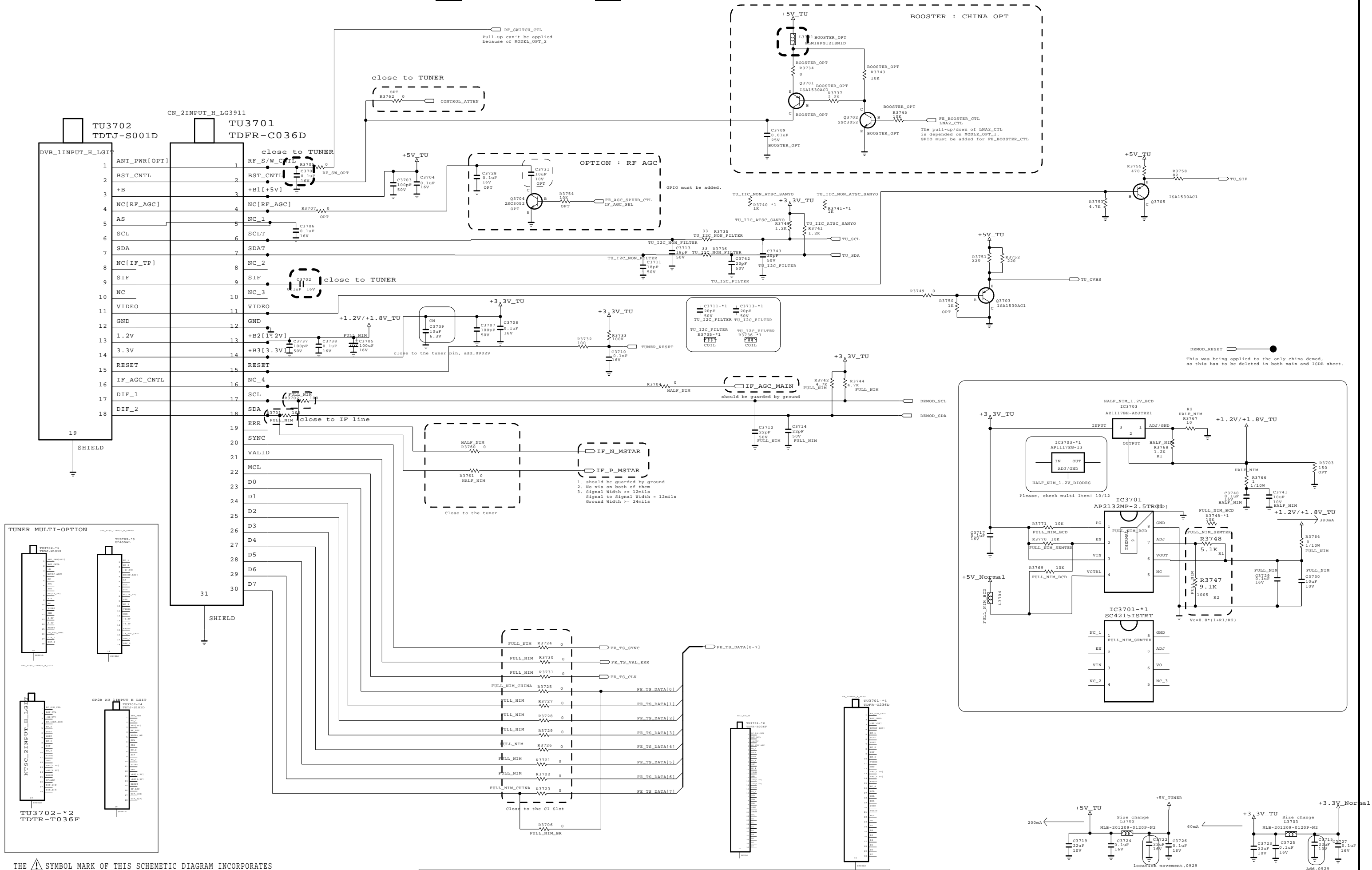
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SECRET
LGElectronics



MODEL	GP2R	DATE	20101023
BLOCK	SFLASH 1MB	SHEET	13 /

GP2R_LARGE_TUNER

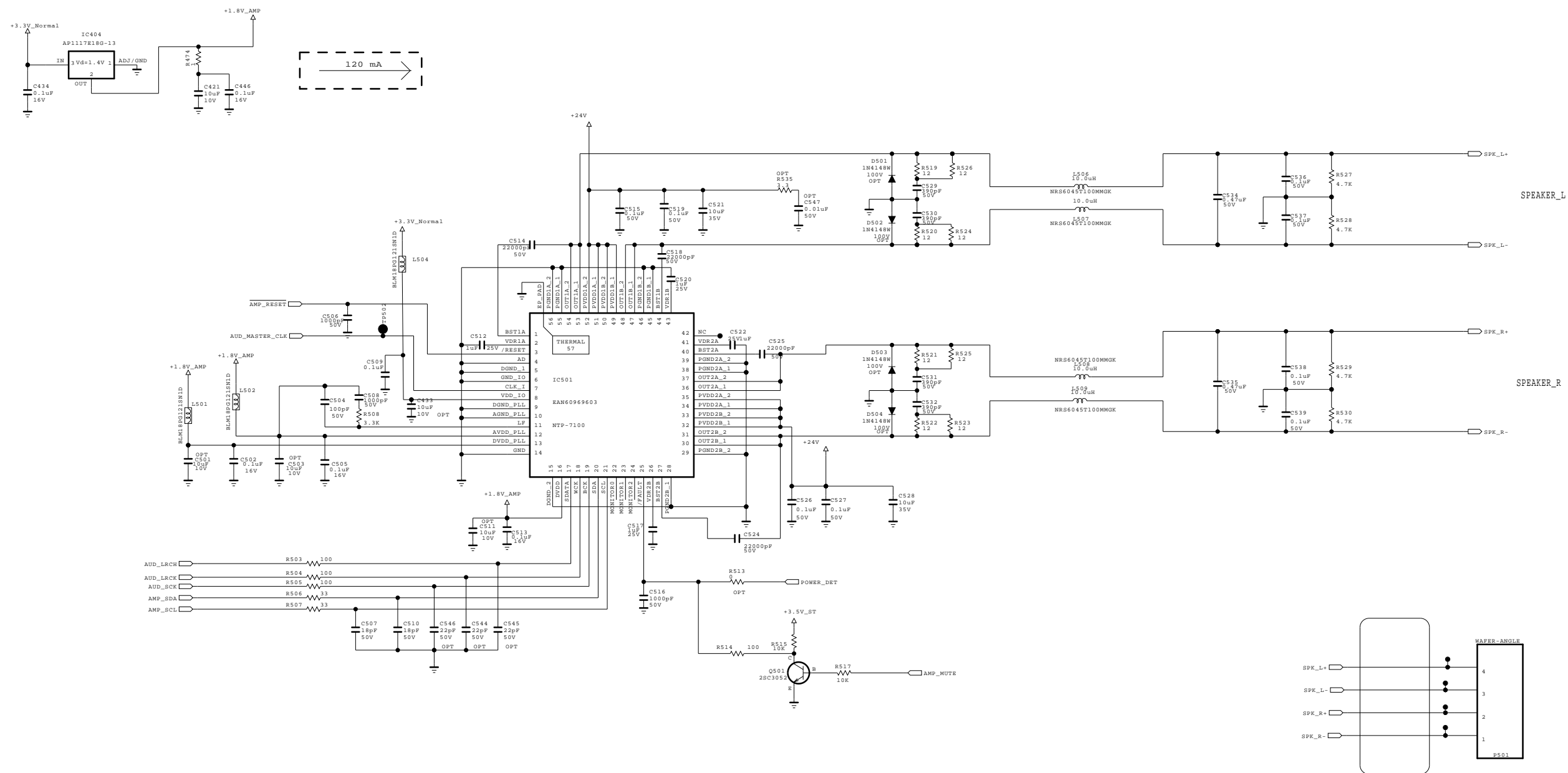




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SECRET
LGElectronics



MODEL	GP2R	DATE	20101023
BLOCK	TUNER_L	SHEET	14 /



THE  SYMBOL MARK OF THIS SCHEMATIC DIAGRAM INCORPORATES SPECIAL FEATURES IMPORTANT FOR PROTECTION FROM X-RADIATION. FILRE AND ELECTRICAL SHOCK HAZARDS, WHEN SERVICING IF IS ESSENTIAL THAT ONLY MANUFACTURES SPECIFIED PARTS BE USED FOR THE CRITICAL COMPONENTS IN THE  SYMBOL MARK OF THE SCHEMATIC.

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LGElectronics

 LG ELECTRONICS

MODEL	GP2R	DATE	20101023
BLOCK	AMP NTP	SHEET	16 /

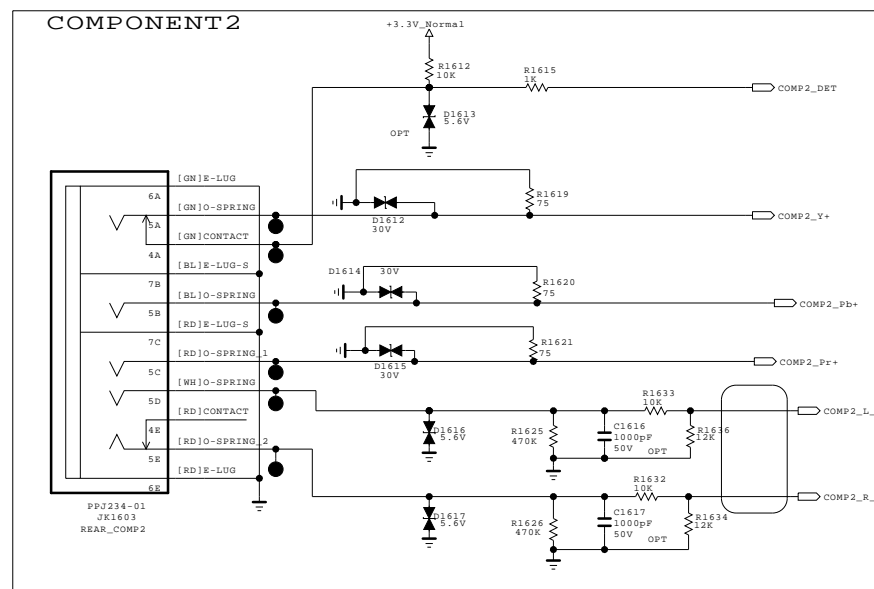
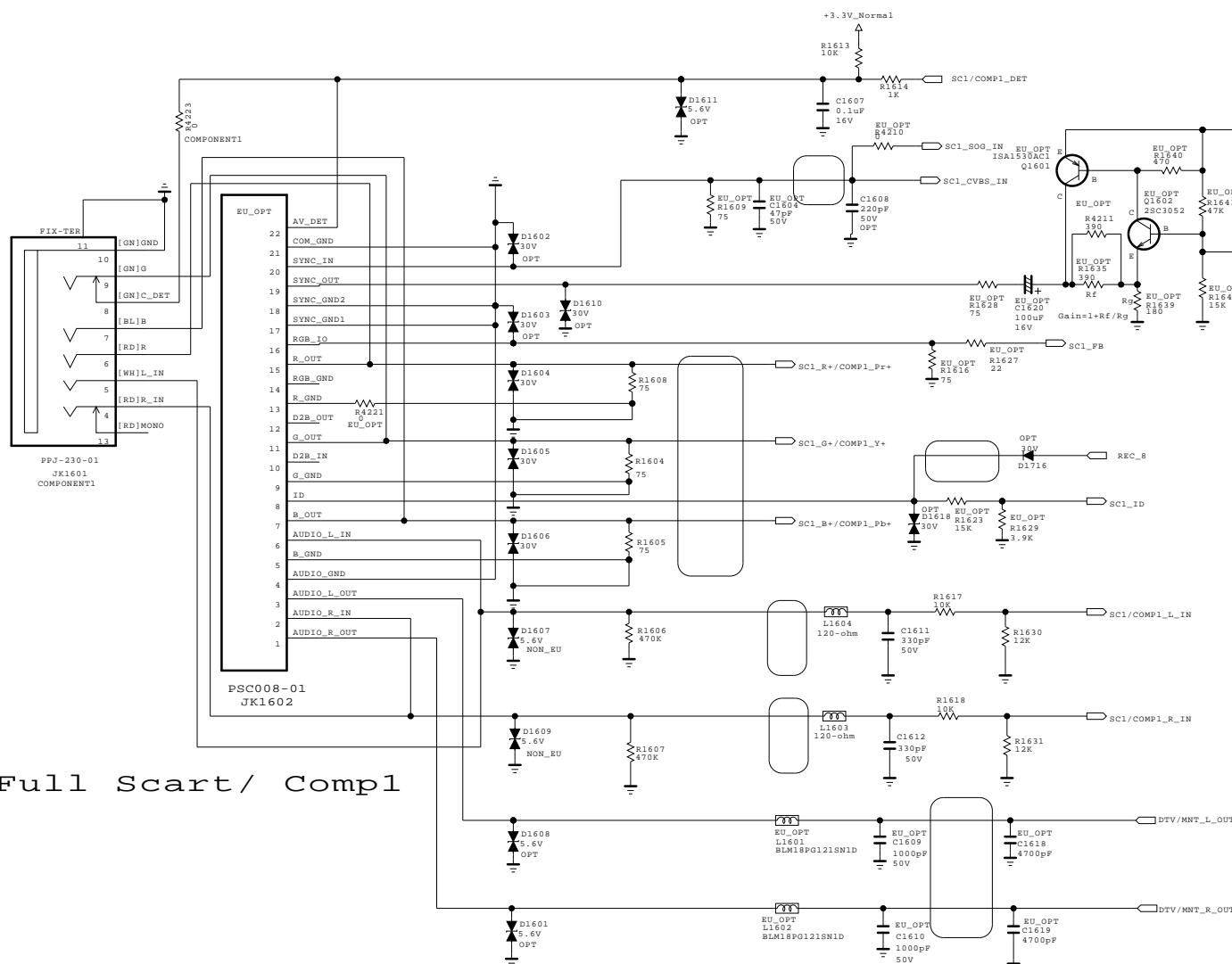


Diagram showing the connection of ET pins to the ET module:

- TP1610 → ET_RXD0
- TP1611 → ET_TXD0
- TP1612 → ET_RXD1
- TP1613 → ET_TXD1
- TP1614 → ET_REF_CLK
- TP1615 → ET_TX_EN
- TP1616 → ET_MDC
- TP1617 → ET_MDIO
- TP1618 → ET_CRS
- TP1619 → ET_RXER
- TP1620 → /RST-PHY



[SCART AUDIO MUTE]

DTV/MNT_L_OUT

EU_OPT
Q1607
2SC3052

EU_OPT
R1648
2K

DTV/MNT_R_OUT

EU_OPT
Q1608
2SC3052

EU_OPT
R1652
2K

EU_OPT
RT1P141C-T112
Q1610

3

1

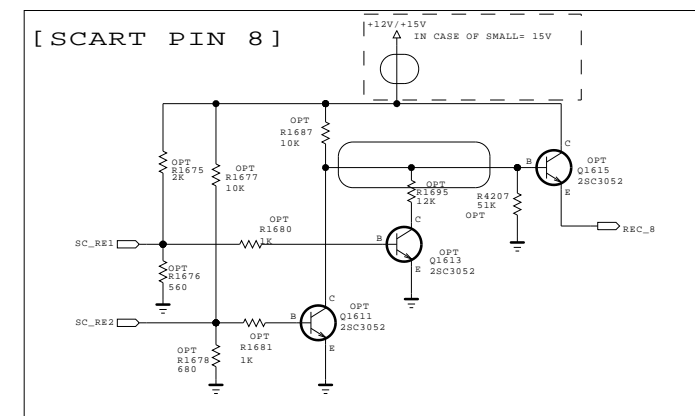
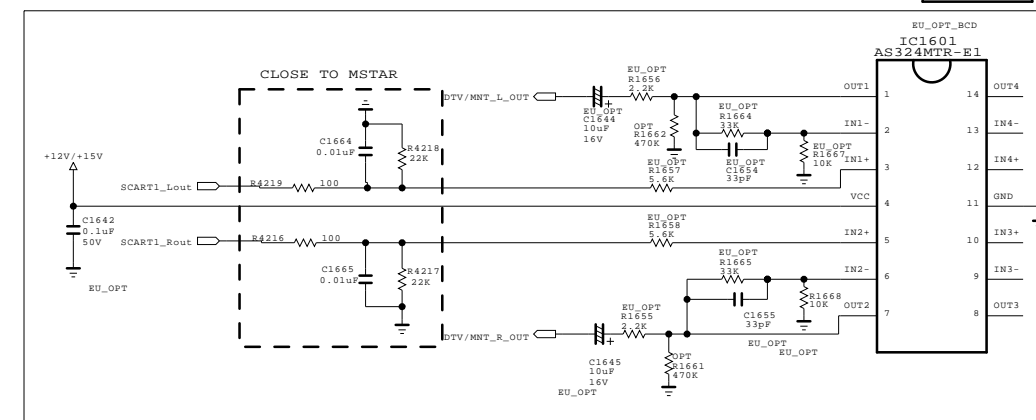
2

EU_OPT
C1636
0.1uF

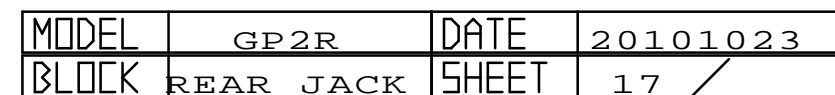
+3.5V_ST

EU_OPT
R1652
10K

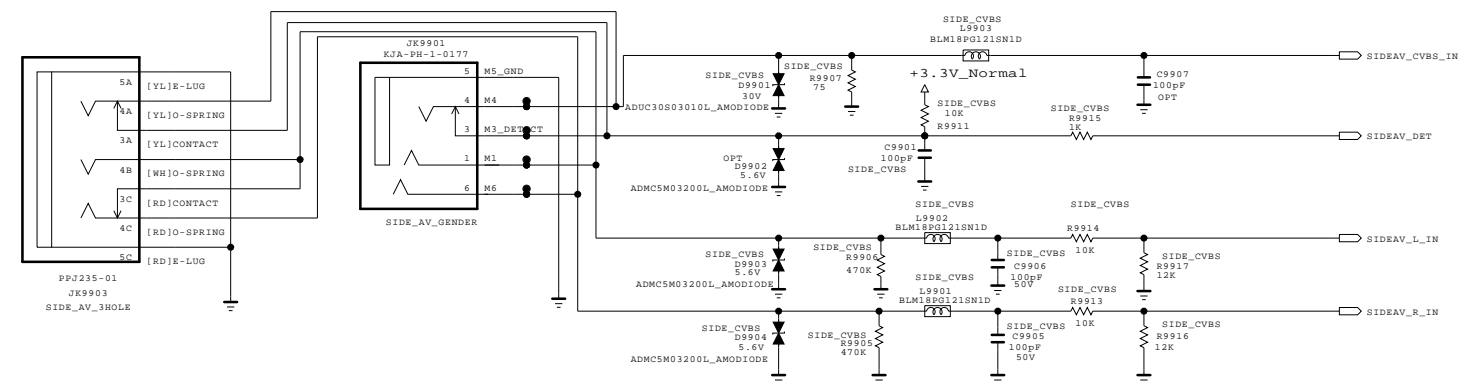
SCART1_MUTE



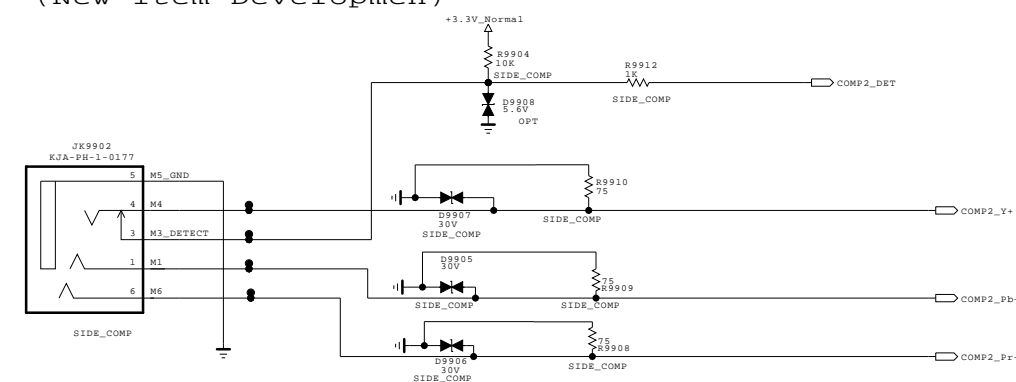
SECRET
LGElectronics





SIDE CVBS PHONE JACK
(New Item Development)



SIDE COMPONENT PHONE JACK
(New Item Development)



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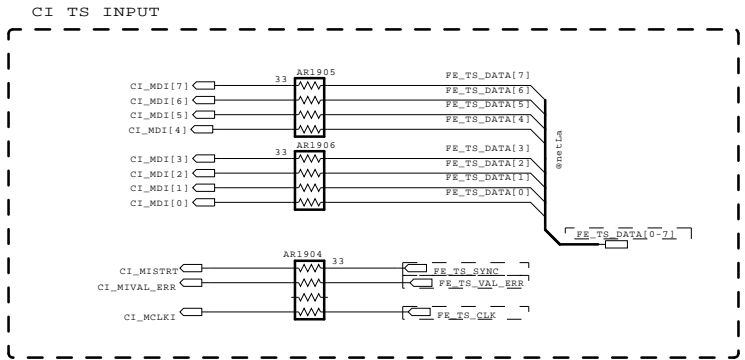
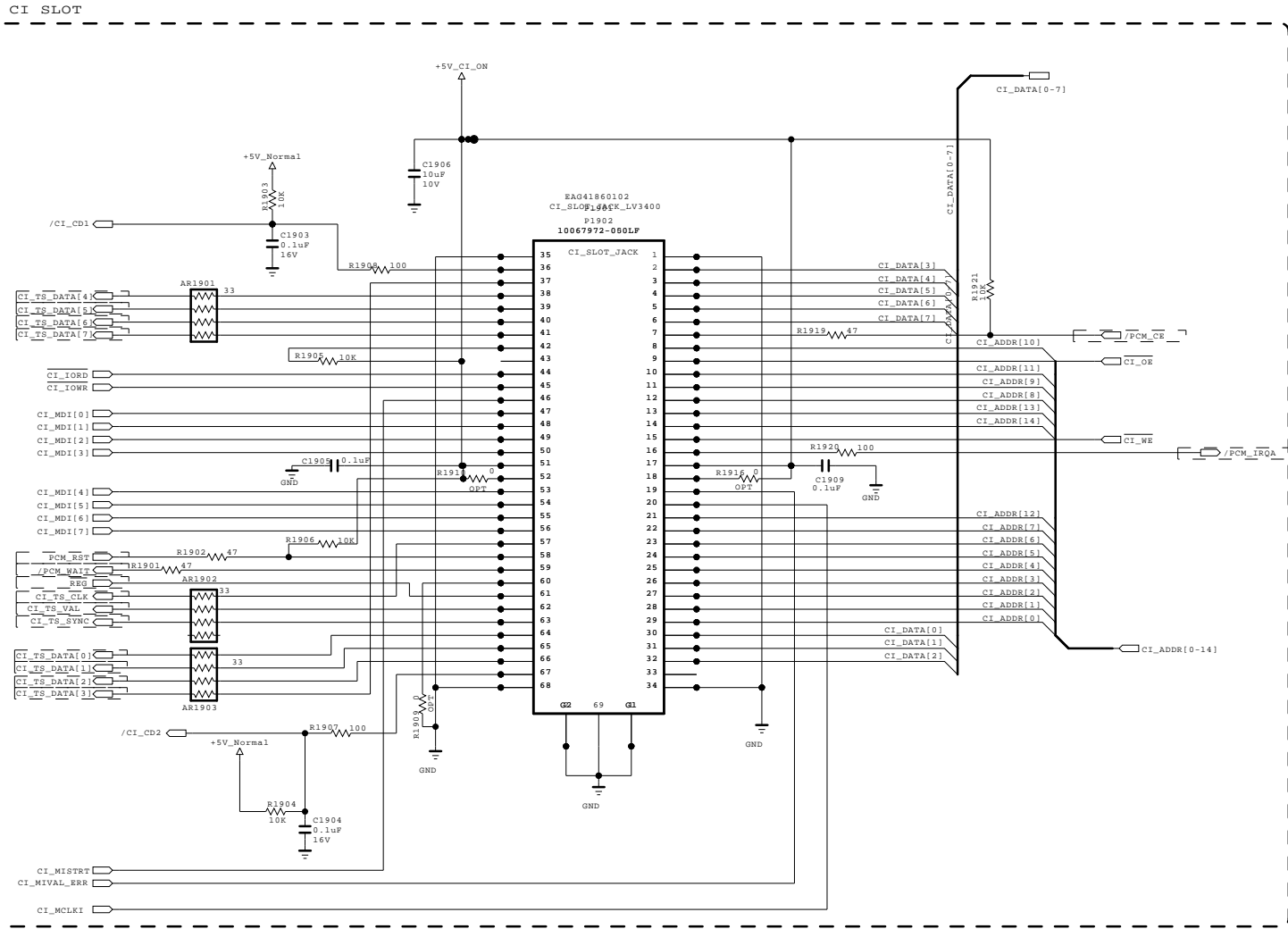
SECRET
LGElectronics



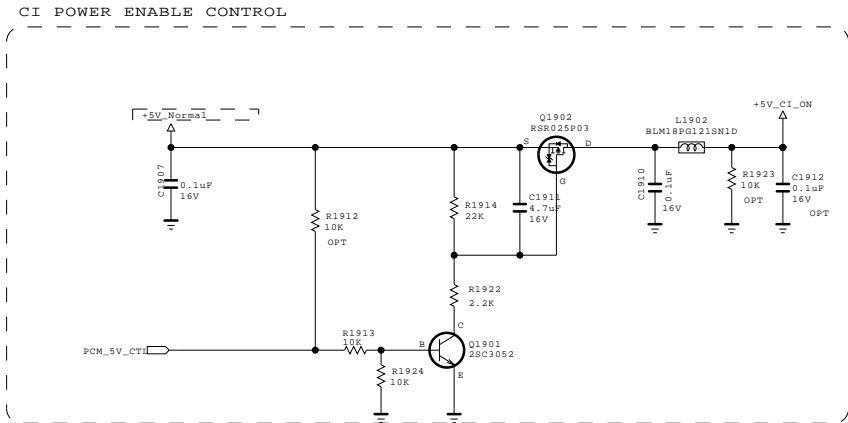
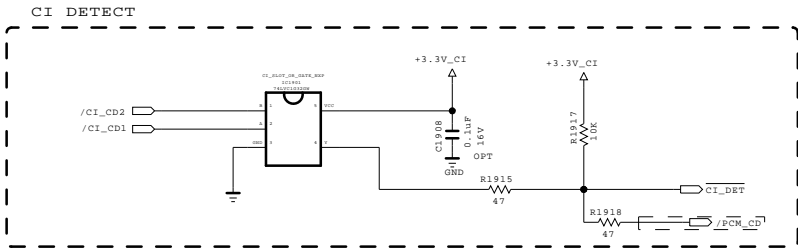
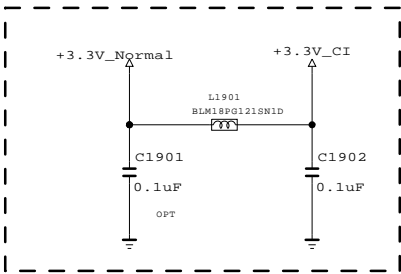
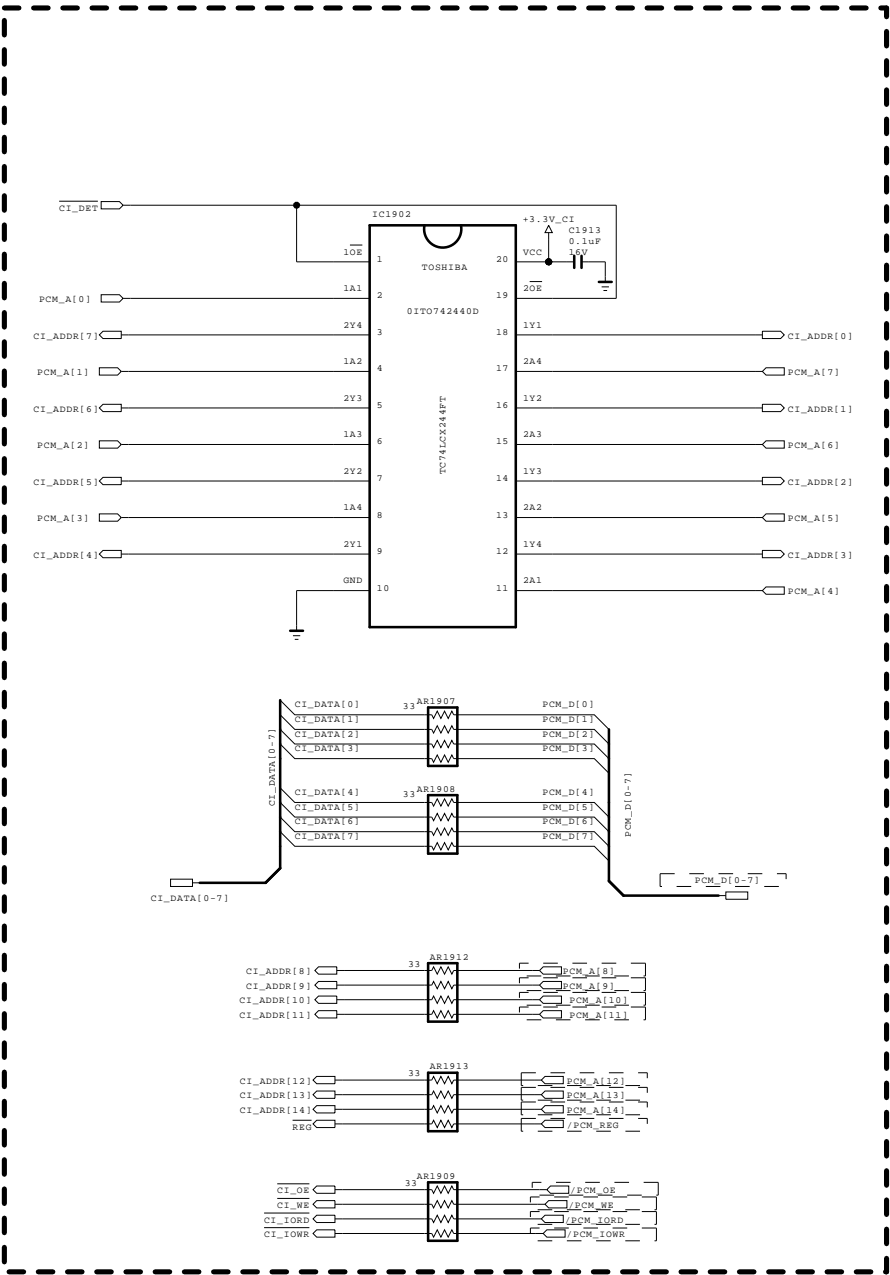
MODEL	GP2R	DATE	20101023
BLOCK	SIDE_JACK	SHEET	18 /



* Option name of this page : CI_SLOT
(because of Hong Kong)

CI Region



CI HOST I/F





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SECRET
LGElectronics

LG ELECTRONICS

MODEL	GP2R	DATE	20101023
BLOCK	PCMC I	SHEET	20 /

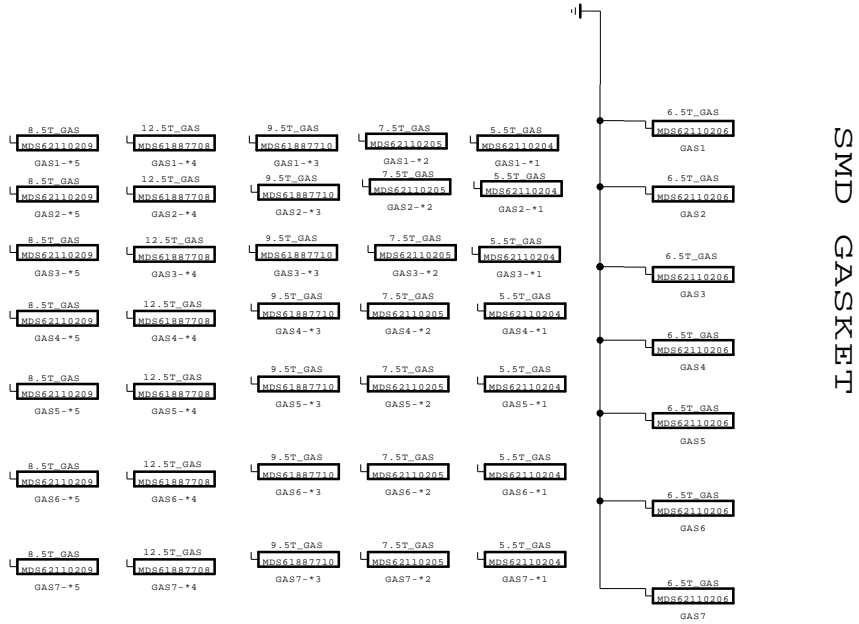
THE  SYMBOL MARK OF THIS SCHEMATIC DIAGRAM INCORPORATES SPECIAL FEATURES IMPORTANT FOR PROTECTION FROM X-RADIATION, FIRE AND ELECTRICAL SHOCK HAZARDS, WHEN SERVICING IF IS ESSENTIAL THAT ONLY MANUFACTURES SPECIED PARTS BE USED FOR THE CRITICAL COMPONENTS IN THE  SYMBOL MARK OF THE SCHEMATIC.

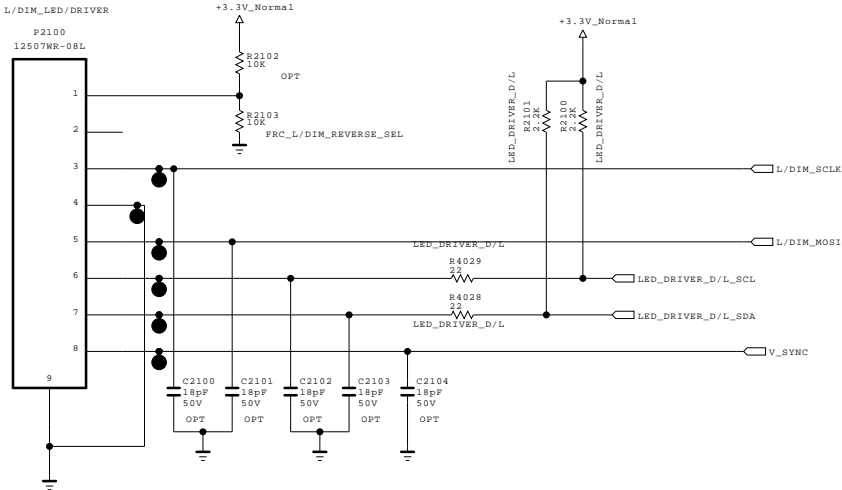
SECRET



LGElectronics



MODEL	GP2R	DATE	20101023
BLOCK	SMD_GAS	SHEET	20 /





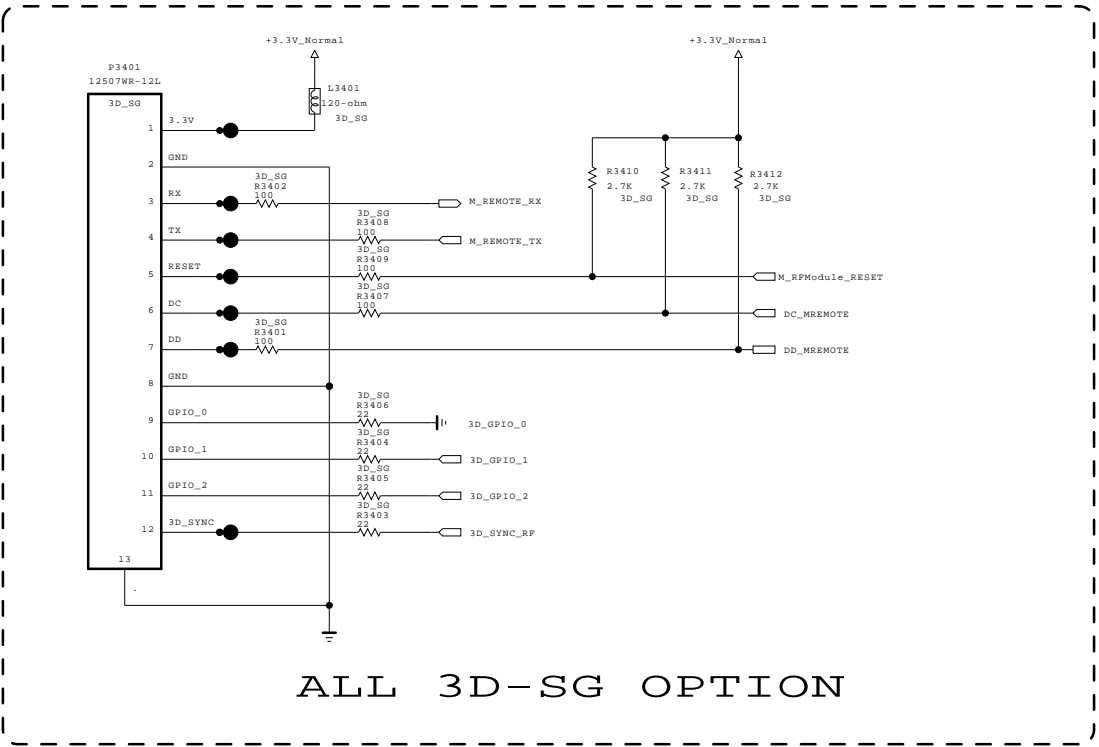
THE  SYMBOL MARK OF THIS SCHEMATIC DIAGRAM INCORPORATES SPECIAL FEATURES IMPORTANT FOR PROTECTION FROM X-RADIATION. FILRE AND ELECTRICAL SHOCK HAZARDS, WHEN SERVICING IF IS ESSENTIAL THAT ONLY MANUFACTURES SPECIFIED PARTS BE USED FOR THE CRITICAL COMPONENTS IN THE  SYMBOL MARK OF THE SCHEMATIC.

SECRET
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MODEL	GP2R	DATE	20101023
BLOCK	L/DIM_LED	SHEET	21 /

TI solution RF-3D OPTION



ALL 3D-SG OPTION

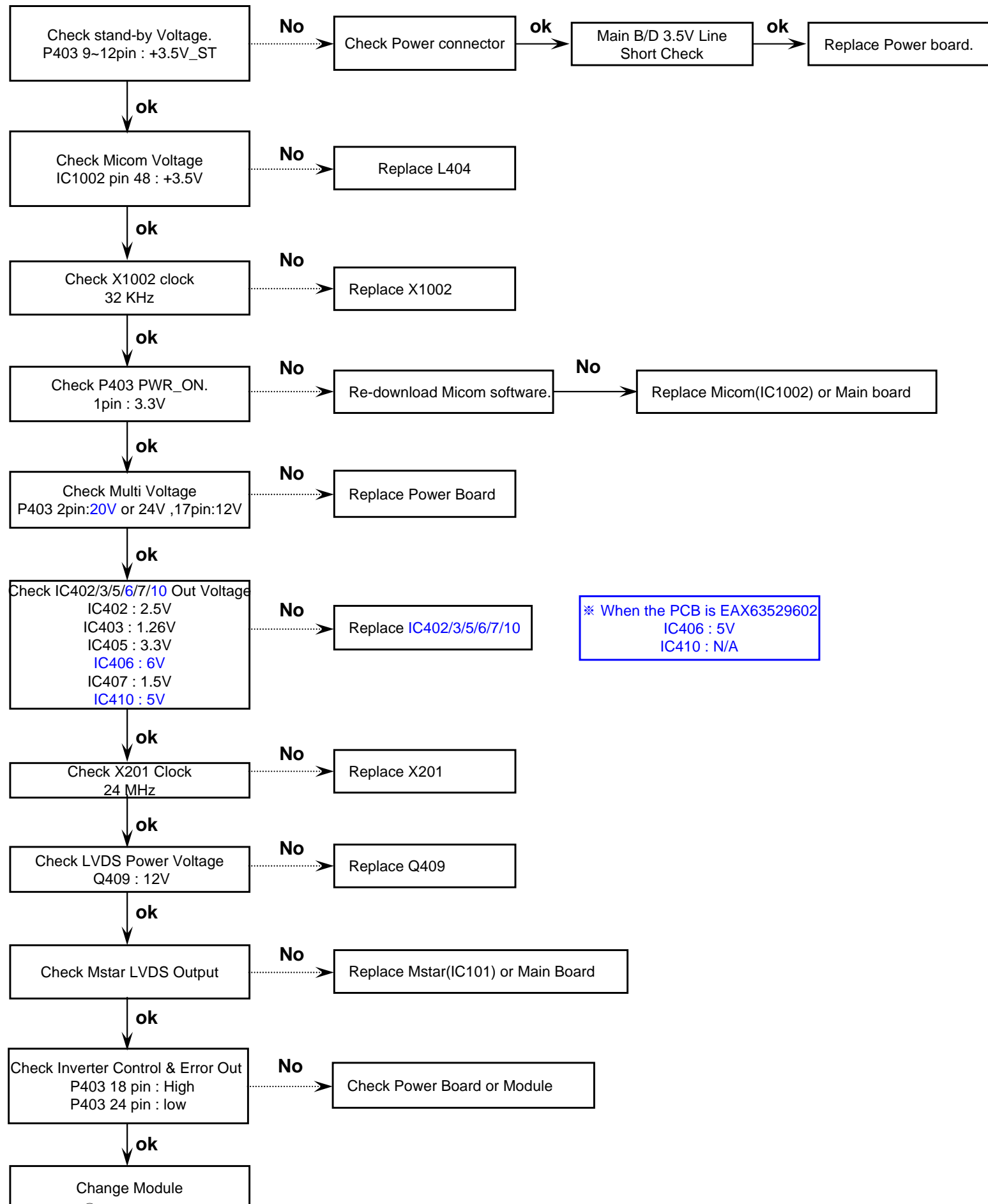
FREQ.	GPOIO_0	GPOIO_1	GPOIO_2
3D Off	0	0	0
60Hz	0	0	1
59.94Hz	0	1	1
50Hz	0	1	1
RESERVED	1	0	0
RESERVED	1	0	1
RESERVED	1	1	0
RESERVED	1	1	1

THE  SYMBOL MARK OF THIS SCHEMATIC DIAGRAM INCORPORATES SPECIAL FEATURES IMPORTANT FOR PROTECTION FROM X-RADIATION. FILRE AND ELECTRICAL SHOCK HAZARDS, WHEN SERVICING IF IS ESSENTIAL THAT ONLY MANUFACTURES SPECIFIED PARTS BE USED FOR THE CRITICAL COMPONENTS IN THE  SYMBOL MARK OF THE SCHEMATIC.



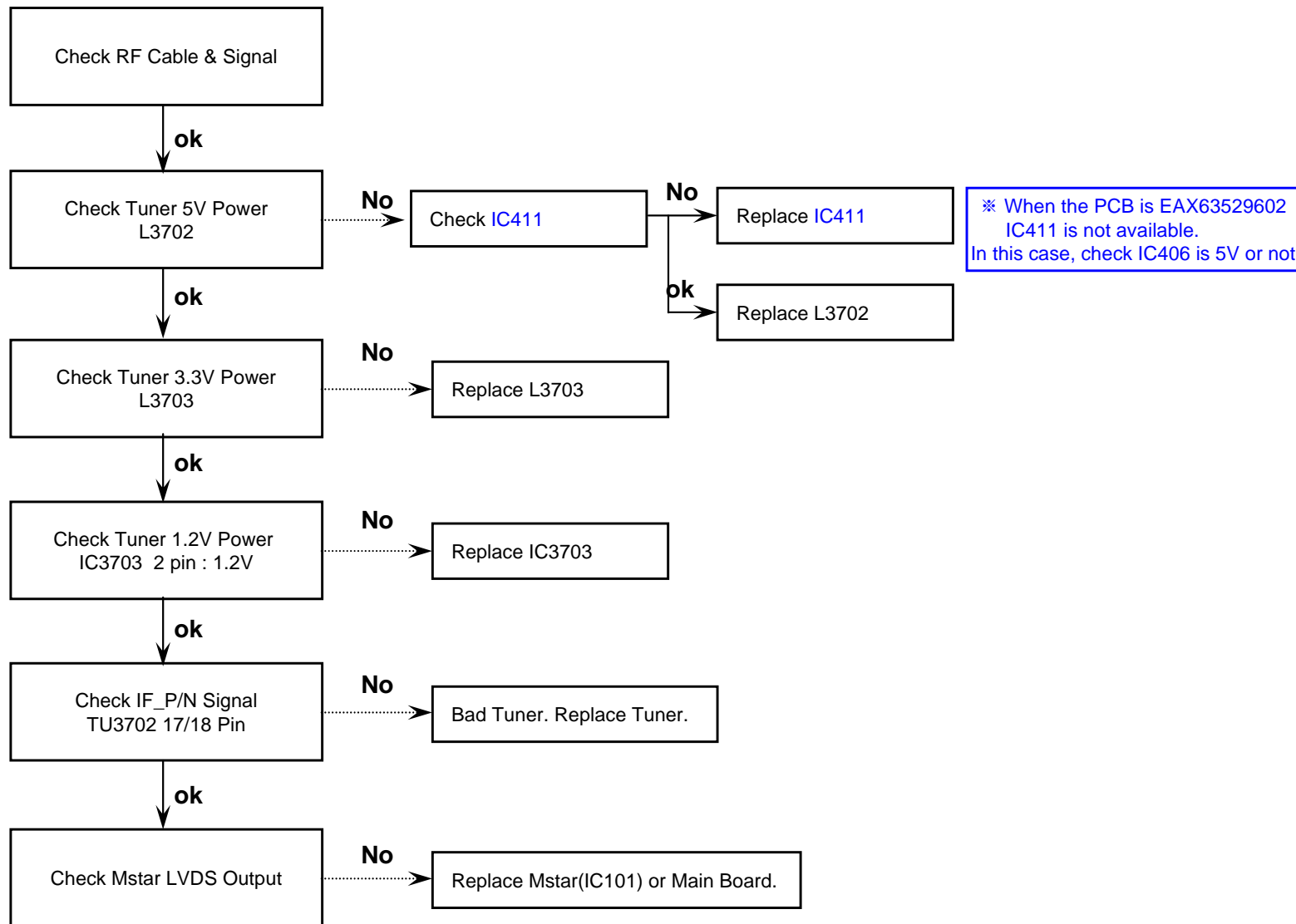
Trouble shooting guide

1. Power-up boot check



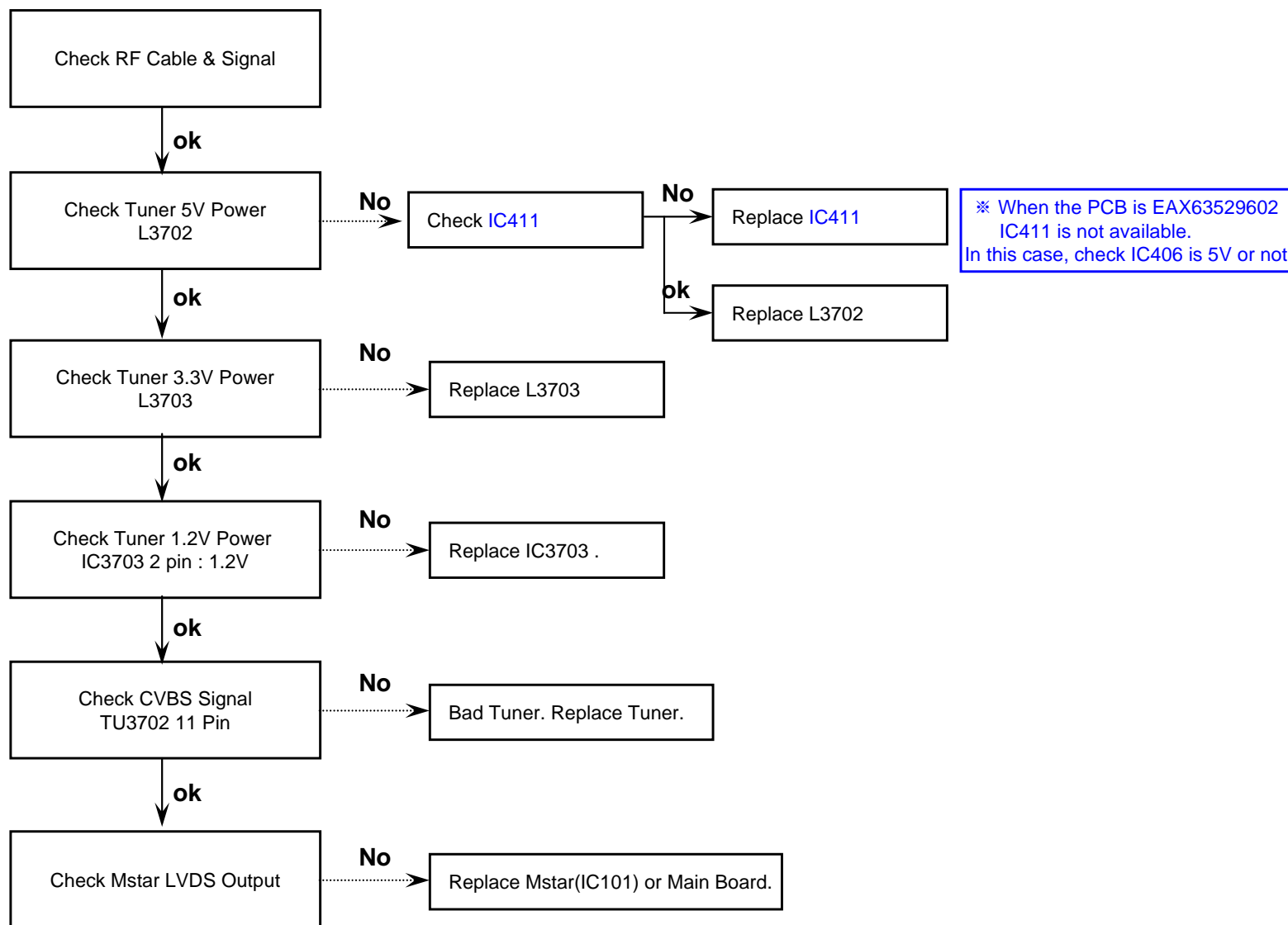
Trouble shooting guide

2. Digital TV Video



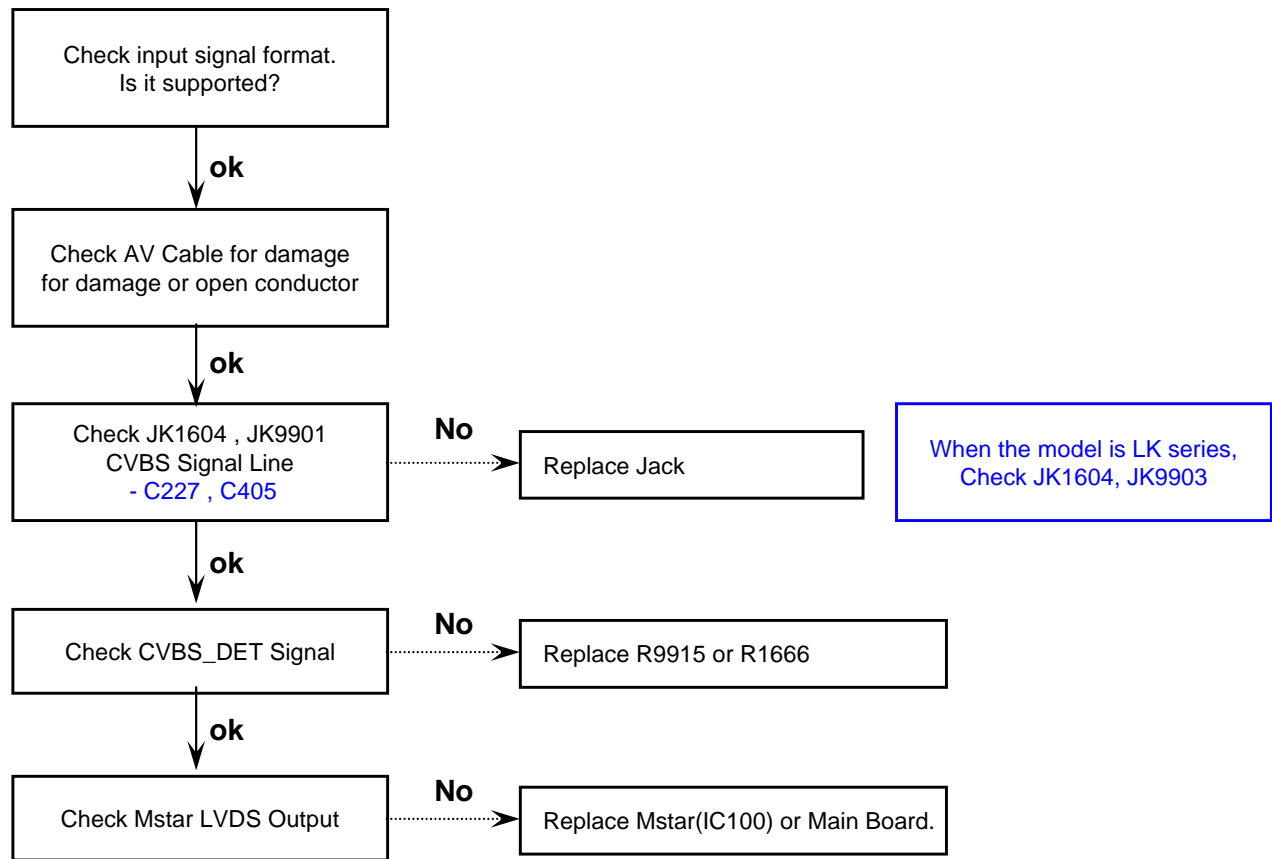
Trouble shooting guide

3. Analog TV Video

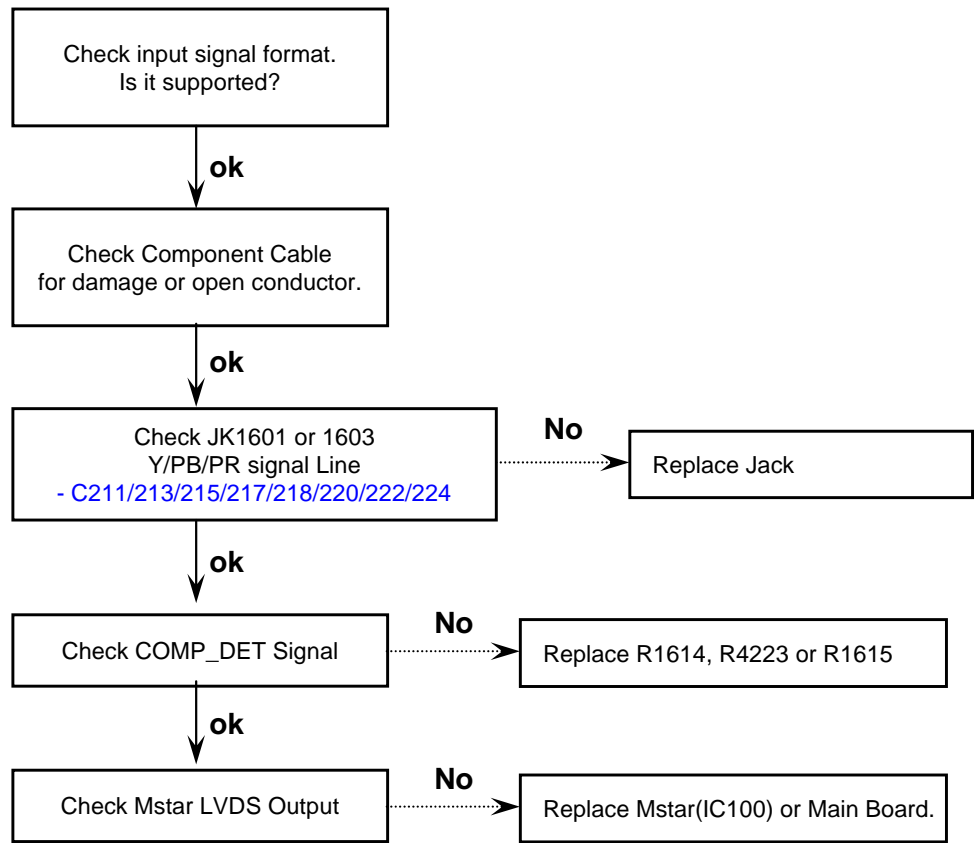


Trouble shooting guide

4. AV Video

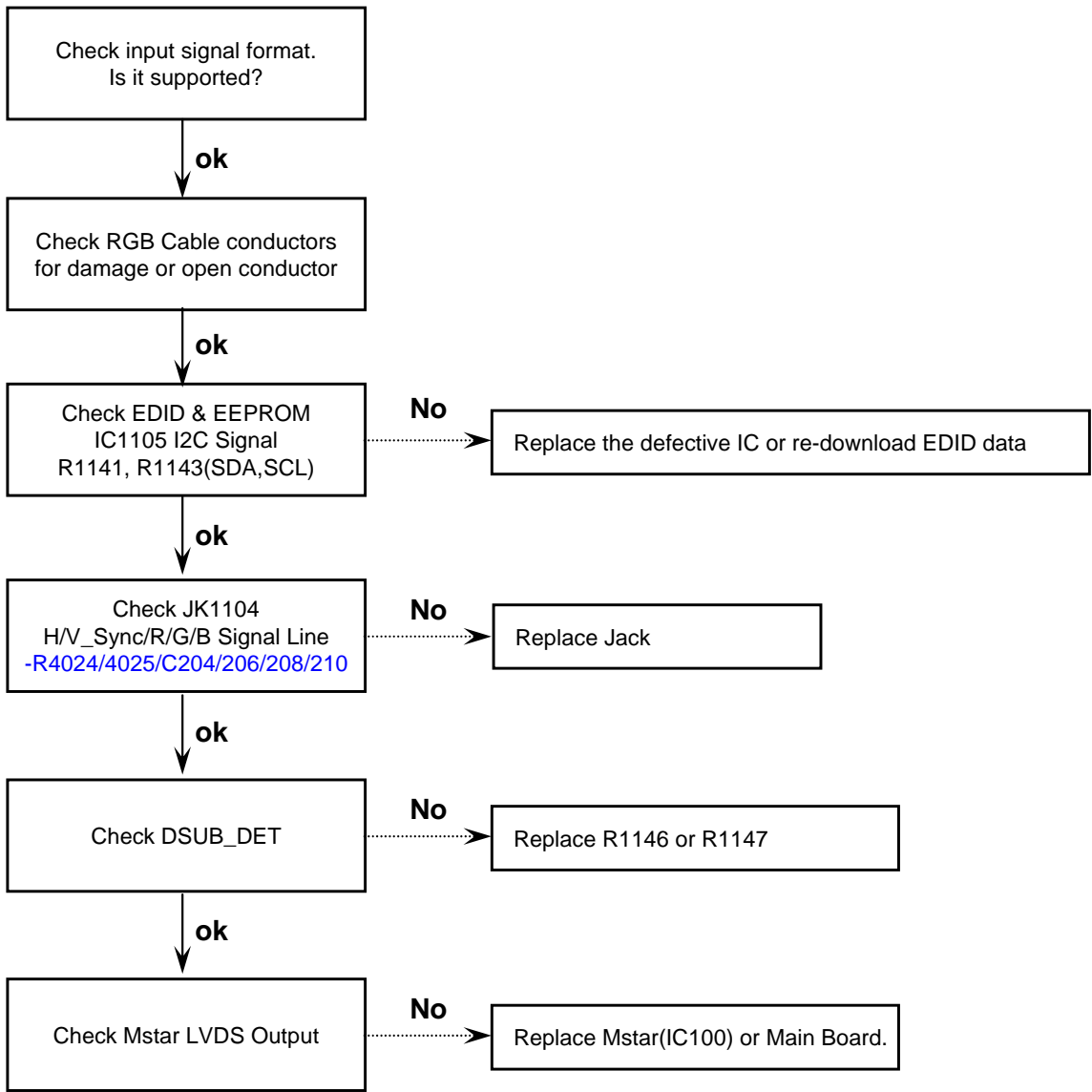


5. Component Video



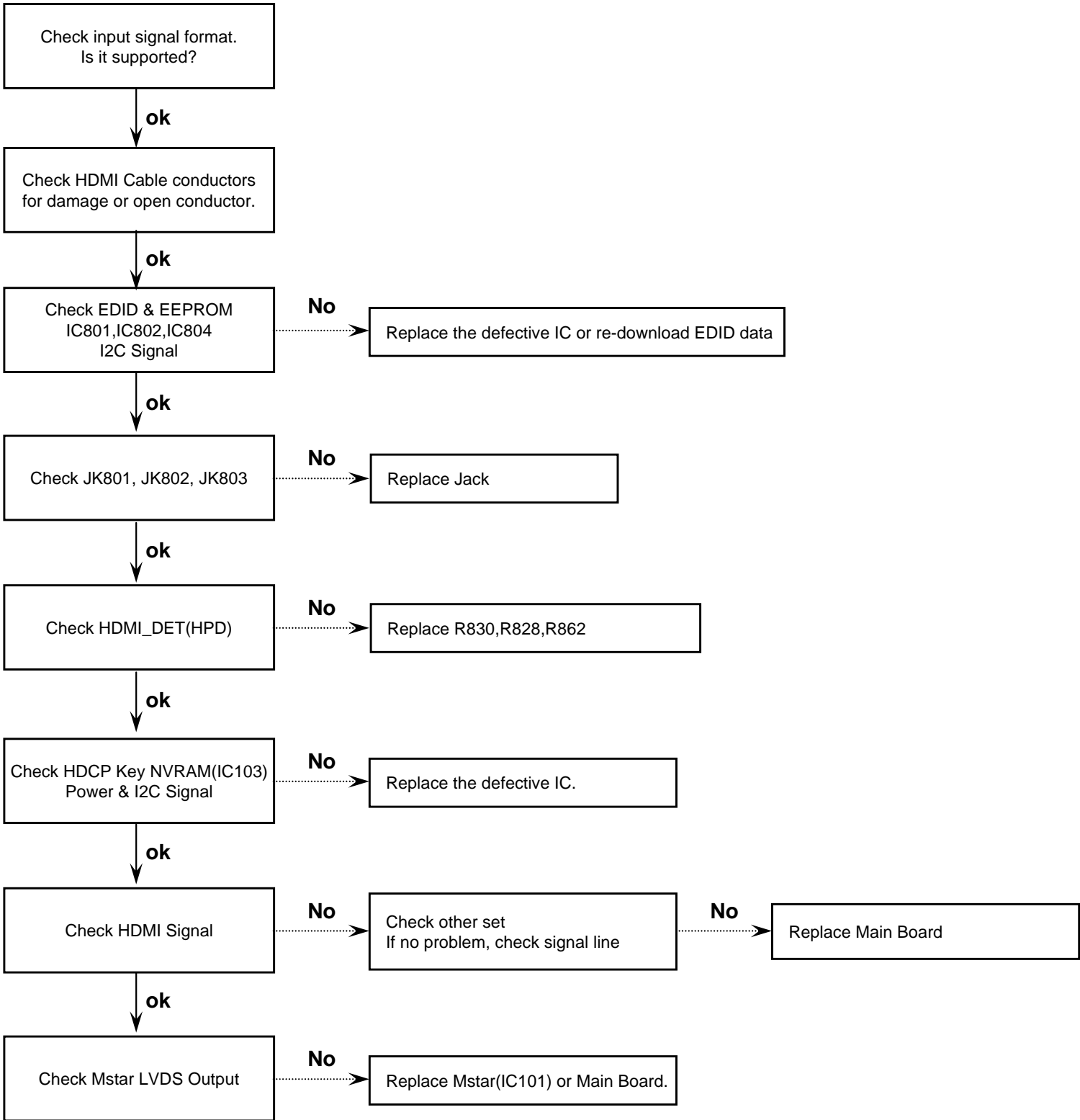
Trouble shooting guide

6. RGB Video



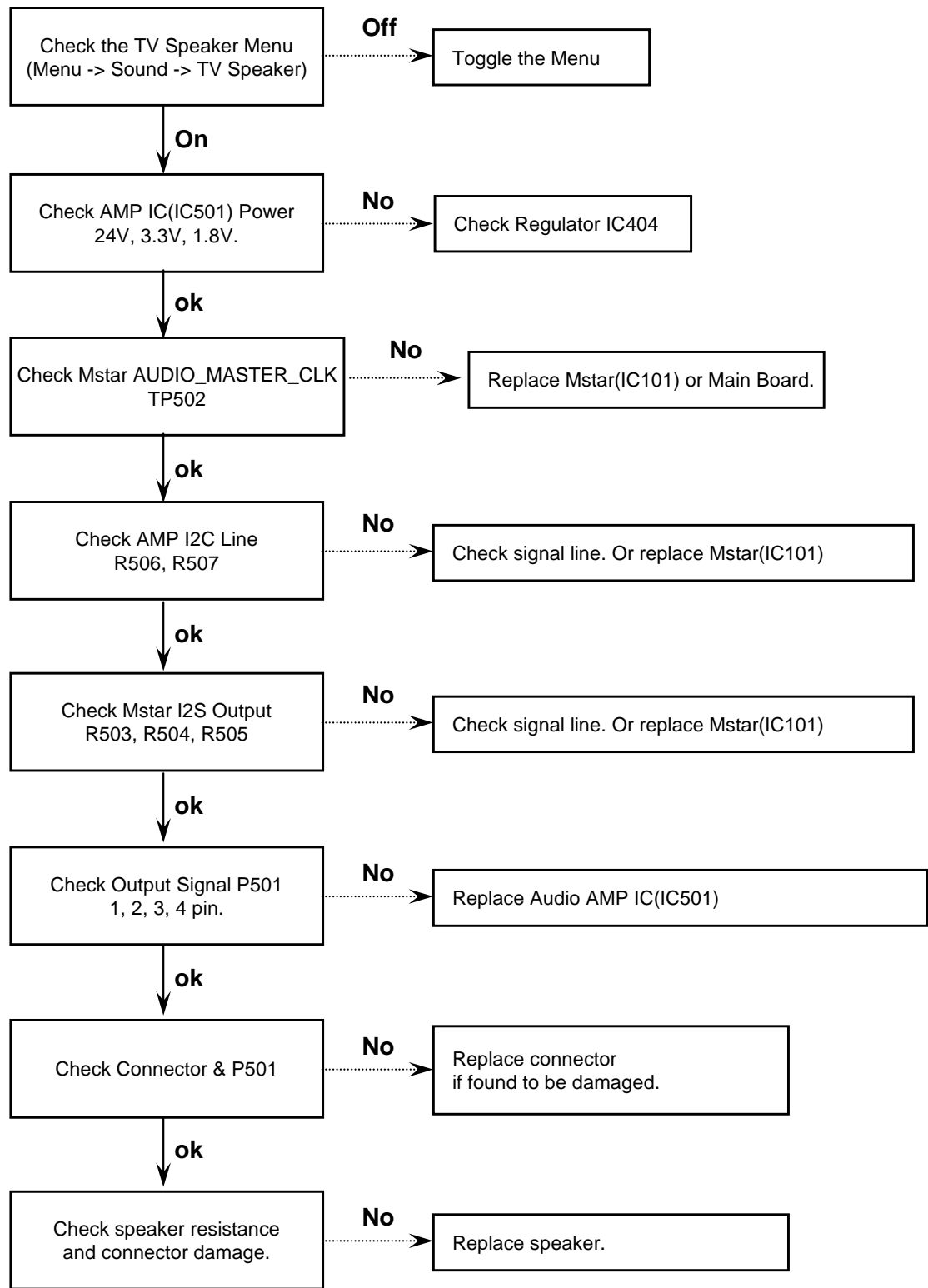
Trouble shooting guide

7. HDMI Video



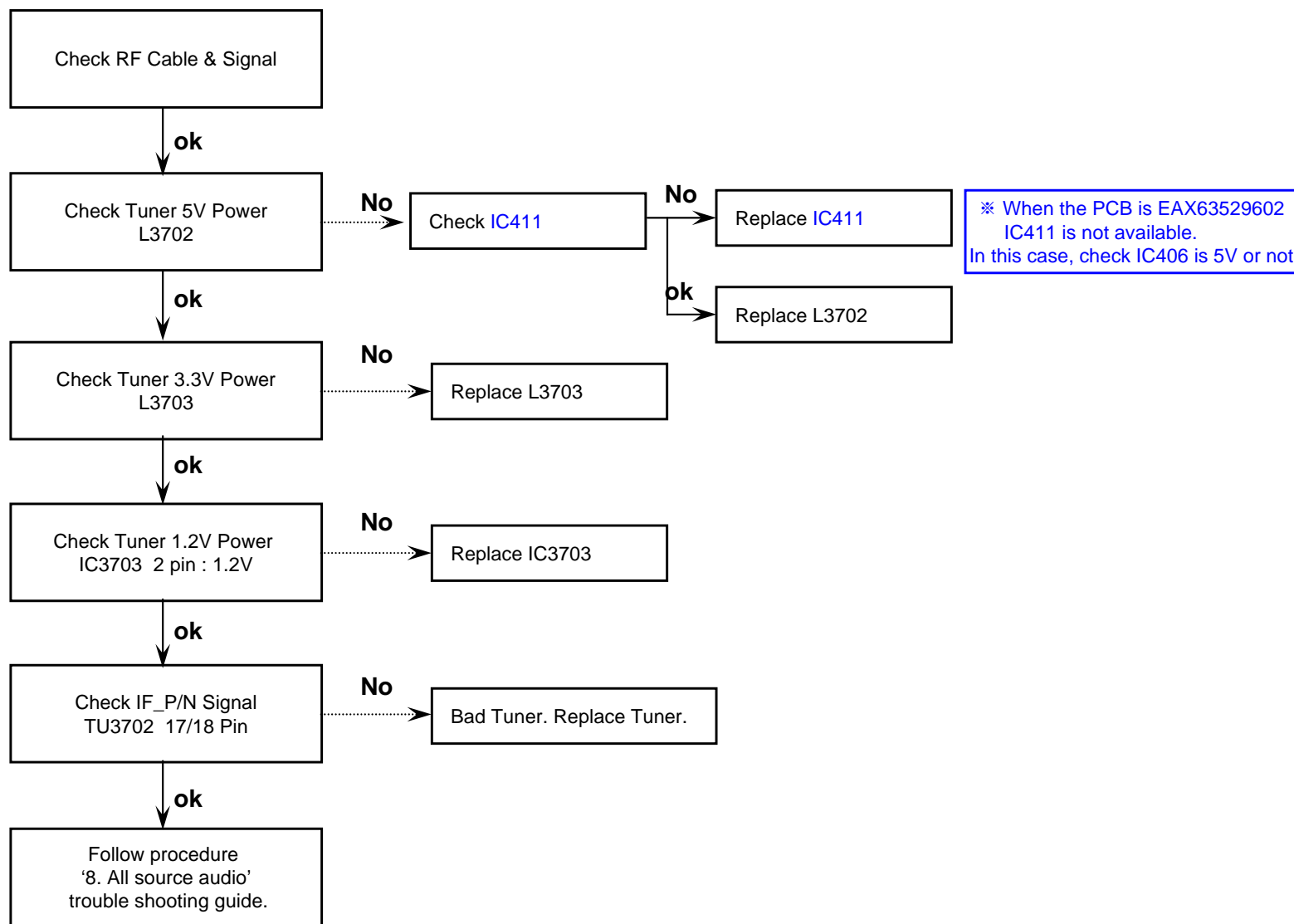
Trouble shooting guide

8. All Source Audio



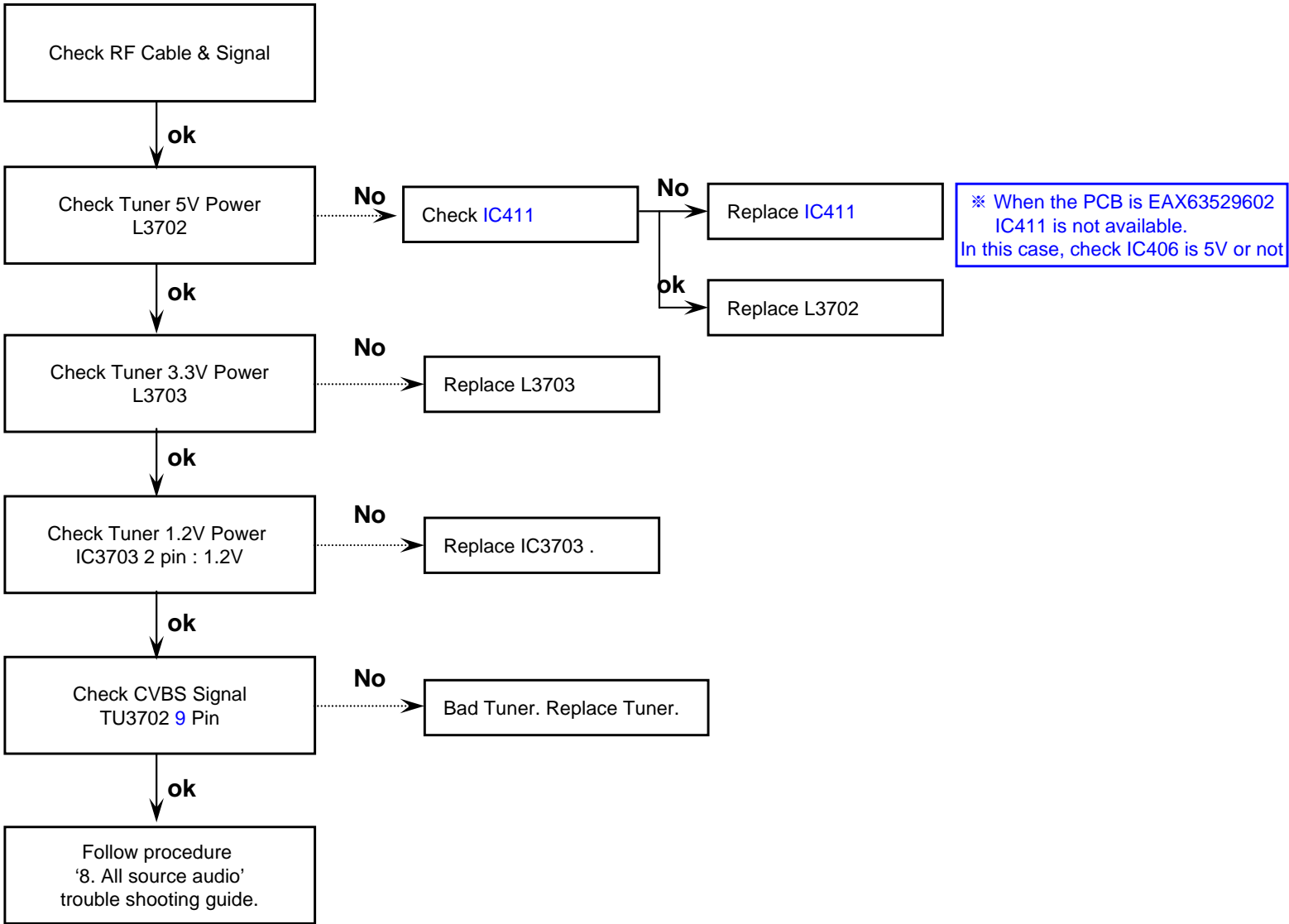
Trouble shooting guide

9. Digital TV Audio



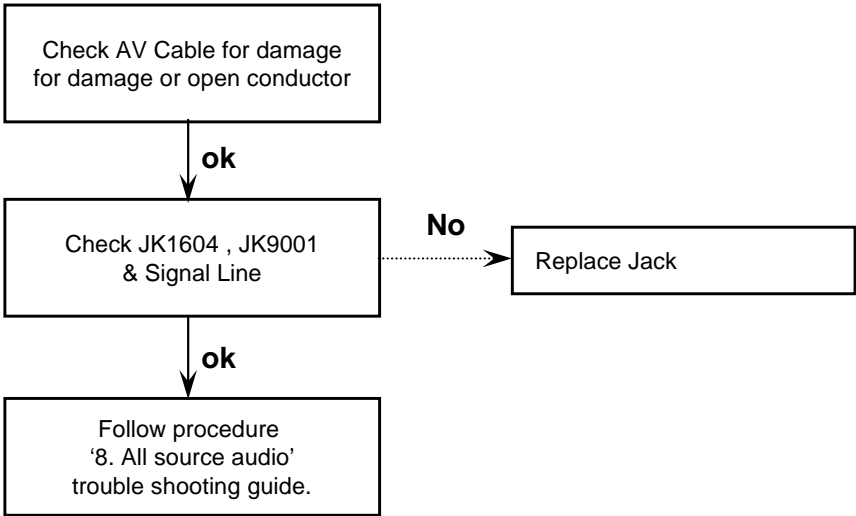
Trouble shooting guide

10. Analog TV Audio

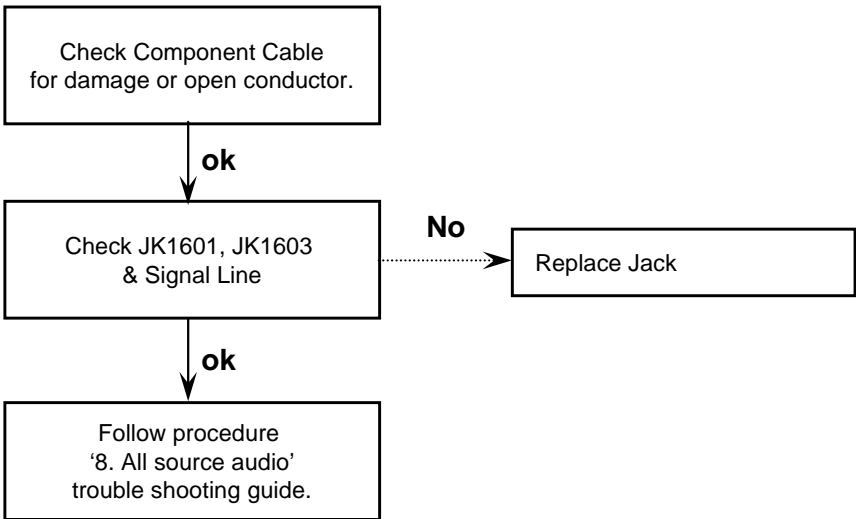


Trouble shooting guide

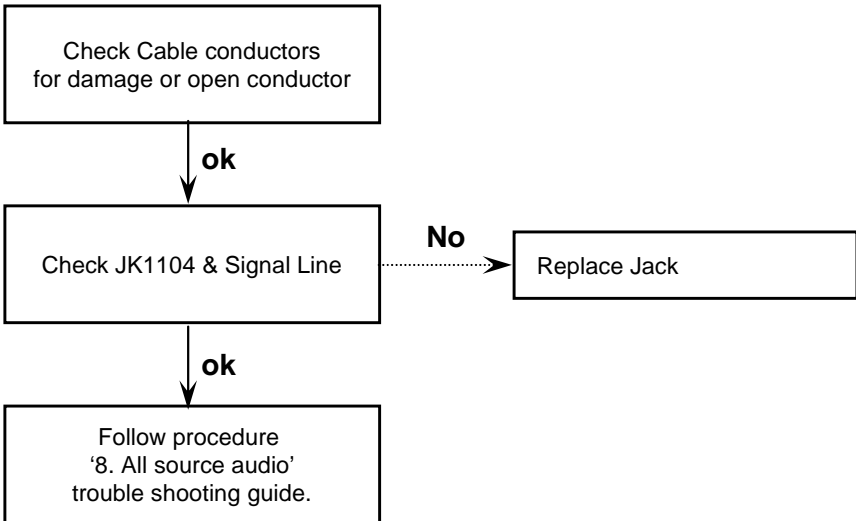
11. AV Audio



12. Component Audio



13. RGB Audio



Trouble shooting guide

14. USB : movie, music, picture

